Hot cloud startups stake their claim. **Page 23**

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Networkworld.com

Gamification of the enterprise

Adding game features to work processes can spark new ideas, boost productivity. **Page 30**

Now that BYOD is the new normal, IT races to adjust

Security, management challenges abound as BYOD goes mainstream

BY ELLEN MESSMER

IT'S INCREASINGLY hard to just say "no" to the growing "bring your own device" (BYOD) crowd, especially with the arrival of new tools like those rolled out last week by Nokia, Motorola and Amazon, and this week from Apple (see "New smartphones spotlight the enterprise," page 14). But that was the initial reaction Information Manager Anthony Peters had when senior executives at the accounting firm where he works started purchasing iPhones and asking for support.

Now almost two years later, with a BYOD policy in place, "the demand comes from everyone," says Peters, who works at Burr Pilger Mayer. Much the same thing is happening all across the country in manufacturing, government, healthcare, high-tech and in law offices as BYOD challenges traditional security and mobile-device management (MDM) practices.

The 600 or so attorneys at Foley & Lardner LLP are

► *See* **BYOD,** *page 18*

CLEAR CHOICE TEST
RADIUS SERVERS

Low-cost RADIUS for Wi-Fi networks

Elektron, ClearBox, Microsoft NPS and FreeRADIUS enable Wi-Fi security for small and midsize enterprises. **Page 38**

Brocade delivers cloud-optimized networks for today and tomorrow.

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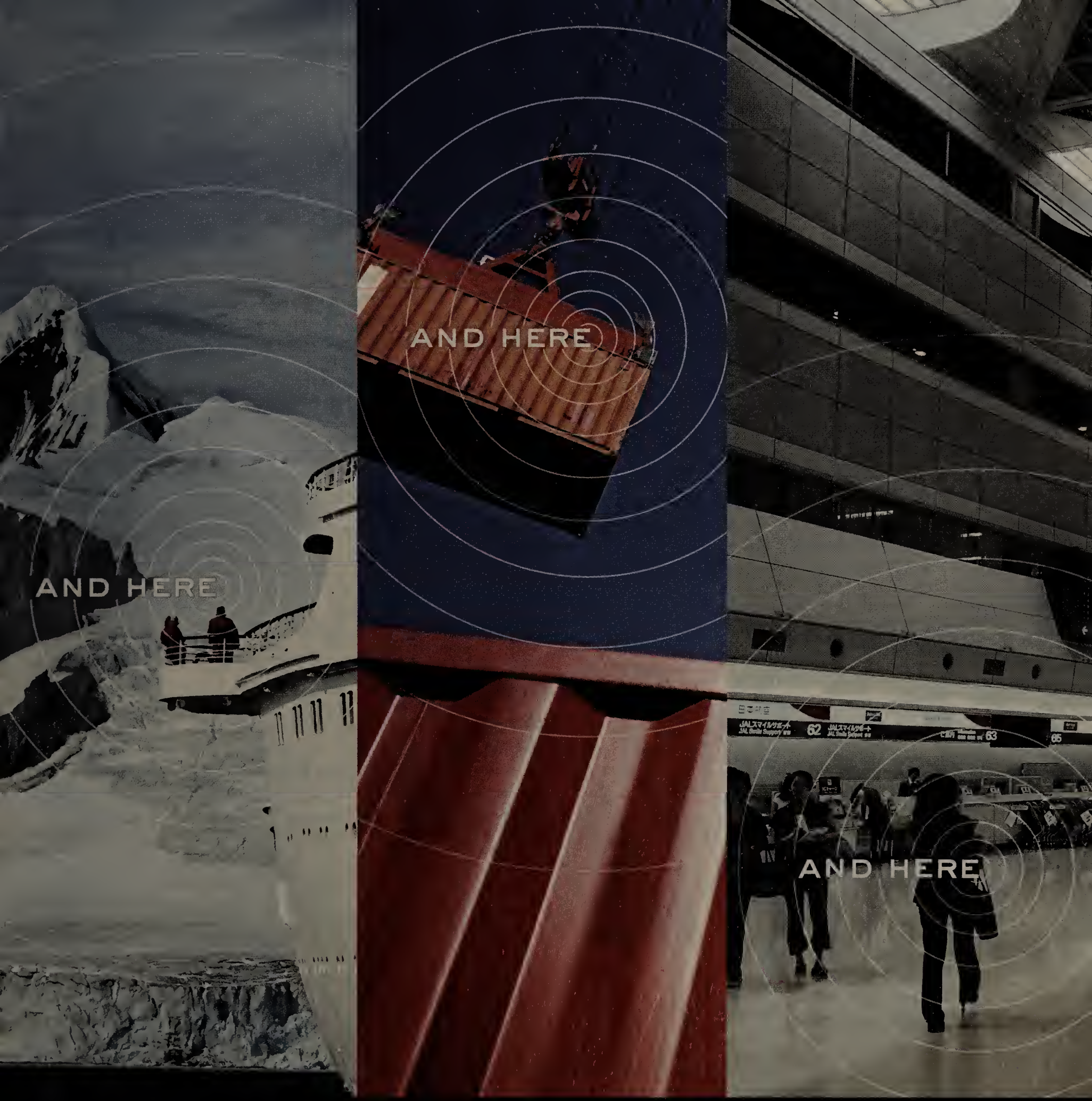


Today's businesses require highly virtualized and services-on-demand environments. And that's causing the network as we have known it to undergo a dramatic change. Brocade is leading this transformation with cloud-optimized networks that simplify infrastructure, increase efficiency, and provide scalability so you can deliver applications, services, and virtualized desktops anywhere on the network, securely and without interruption. Soon, we'll even be able to do the same with your entire data center. The future is built in. Brocade has over 25 combined years in building data center networking and Ethernet fabric technology. Learn why 90 percent of the Global 1000 and two-thirds of the world's Internet exchanges rely on Brocade at [illegible]

SMARTER TECHNOLOGY FOR A SMARTER PLANET

FROM DETAILS TO DESIRES: THE POWER OF BIG DATA.

Companies aren't short on data. In fact, with the average large business storing more than 200 terabytes, companies have more than enough data to tell them who is buying their product, as well as how, when and where the buying happens.

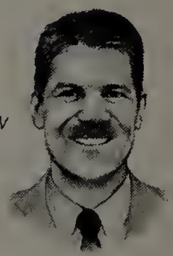
DATA'S NEW VOICE.

Today, however, customers expect a company to know why they're buying. Or why they aren't. Because when a company knows what motivates customers, it can serve them better.

The good news is such data exists, just not in the columns, rows, reports and purchase histories we're used to. It's called big data, and it comes from tweets, videos, clickstreams and other unstructured sources. It's the data of desire. And today, we have the technology and tools to make sense of it.

So now, instead of learning which customers it has lost, a company can learn which customers it might lose and present timely offers or products motivating those customers to stay. Using IBM Smarter Analytics to identify which customers were most likely to switch to another communications carrier, XO Communications was able to predict likely customer defections within 90 days, reducing churn by 35 percent the first year.

> ***"For the first time, we can decide which promotions to run based on facts rather than gut feel."***
>
> **Patrick Neeley**
> *Chief Business Officer, Chickasaw Nation Division of Commerce*



Combining big data with company data paints a better picture of the customer.

80% *of the data currently produced is unstructured—coming from sources like images, videos, tweets, posts and e-mails.*

MINING MOTIVATION.

Enter Smarter Analytics from IBM—software, systems and strategies that help companies combine their own enterprise data with their consumers' unstructured data to see a fuller picture. A big data platform, paired with predictive and sentiment analytics, allows organizations to correlate, for example, sales records with social media mentions for more relevant insights.

With IBM Smarter Analytics, companies are gathering big data and using it to ask—and answer—smarter questions about what their customers really want. **ibm.com/usingbigdata**

LET'S BUILD A SMARTER PLANET.

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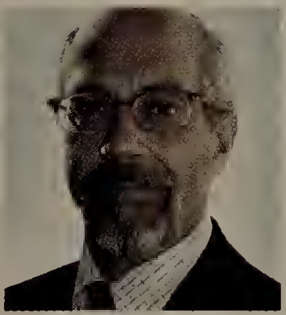
FROM THE EDITOR | JOHN DIX

Companies to watch

I get to meet a lot of interesting companies in my capacity here at *Network World*, some of them newcomers, some more established. Here's a roundup of a few that are addressing common problems:

Enterproid: Founded by folks that worked in mobile security at Morgan Stanley, the company offers a BYOD solution called Divide for Android and iOS devices. With Divide, employees download an app that creates a secure work bubble on their device. When a user clicks on the app they get access to their corporate email, apps and even phone settings provisioned by IT, all of which are corralled in a secure container that IT can control. The technology, which is not hypervisor based, even runs on the Kindle Fire and meets a range of strict compliance regulations (see divide.com).



Talari Networks: If you use broadband to back up your MPLS links to branch offices, or need more bandwidth to remote offices but can't justify adding another MPLS trunk, Talari's Mercury appliances will enable you to amalgamate the capacity of both MPLS and broadband trunks. In use, the boxes constantly assess the quality of MPLS and broadband connections and route packets accordingly, meaning you can actually use that broadband bandwidth that had been reserved for backup, and also benefit from the ability to immediately route around failed links (see talari.com).

Ipanema: A French company that is newer to the U.S. market, Ipanema, like Talari, sells appliances that can share bandwidth among different types of links, but the company's focus is on application performance and monitoring and control. You determine what traffic should be top critical (say VoIP), critical (maybe ERP) and less critical (say Facebook), and the appliances manage these app flows across the available links. The devices also generate detailed WAN governance reports, showing what applications used what capacity (see ipanematech.com).

FireMon: Humans make mistakes when it comes to complex IT security environments, meaning that devices meant to provide certain protections often do not. FireMon's tools are designed to help you more effectively manage network security gear by giving you visibility into what the tools are doing/how they are configured and how they interact with other systems in the security ecosystem. The company than layers on top of that info about threats and vulnerabilities in the organization to build a picture of risk (see firemon.com).

Coveo: While enterprise search has been commoditized, Coveo makes it possible to correlate information from disparate sources, everything from email and Web content to engineering, ERP and CRM records and even social media tools. The information is federated and normalized into a central index, and then you customize the way to view it. You can even add people to the equation, making it possible to home in on in-house experts on a given subject (see coveo.com).

John A. Dix

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peersay

Can iPhone 5 sway Android users?

IN MY VIEW there are five things that Apple should do to compete with Android better (other than suing them!) (Re: "5 reasons Android users will switch to the iPhone 5"; tinyurl.com/9x9gaa3):

1) Increase the range of phones on offer, with different screen-size choices along with budget and high-end models.

2) Improve connectivity for compatibility with something like MicroSD.

3) Don't enforce the use of iTunes — I prefer to buy my music and videos from other legal sources and manage it myself.

4) Make all the iPhones (except maybe budget ones) with SD card slots to expand the 16GB or 32GB standard.

5) Include changeable batteries.

Clive Richards

YOU'RE FORGETTING THAT everyone has had, or knows someone that had, a crappy Android phone. Anyone that has picked up a pure Jelly Bean device would probably not consider the iPhone, but keep in mind that many people are still on a subsidized Android phone running 2.3 waiting for the new iPhone so they can switch. It'll be a game changer.

Therealciviczc

DON'T FORGET THE snowballing "hatred" toward Apple for its recent tactics: a barrage of lawsuits against what is seen as the vendors of Android innovation (Re: "5 reasons Android users won't switch to the iPhone 5"; tinyurl.com/cppwgsf).

There are some very bad feelings en masse, even from many Apple users. I believe this is really going to show when the next product comes out.

Tim Omaha

> You're forgetting that everyone has had a **crappy Android phone**.

Facing our fragmented future

HEY, SOMEONE FINALLY gets it. We're heading toward a fragmented future, where different devices handle different tasks instead of a single white box that does everything (Re: "Lenovo North America president: 'It's a dual-device world'"; tinyurl.com/9kem8ez).

cppthis

Wrong mag for PC building how-to

CUTE ARTICLE AND still good advice for general consumers. This being *Network World*, however, we all started building PCs in grade school (give or take). This kind of article should be in a mainstream magazine like *Better Homes and Gardens* (I couldn't think of a mainstream mag 'cause I don't read them) (Re: "Building your first desktop PC"; tinyurl.com/9ml8xn6).

Chris Fricke

A refreshing take on Mint 13

IT WAS GREAT to read a review that isn't simply a cheerleading session for either of the two most popular distros. It was also refreshing to see that this wasn't the cut-and-paste from the press release, grab a few screen shots type of review. The distro was thoroughly tested and the review that actually kept track of previous issues and examined upgrading from previous releases. Thank you very much (Re: "Linux Mint 13 leaves sour aftertaste"; tinyurl.com/cy6xrcv).

John Shepherd

Both parties guilty of mining data

TOO MANY ARE getting sucked into the "my party vs. your party" game, when the point is that both parties are using people's lives as products for marketing. If you're happy to be a means to someone else's end, then by all means boast about "your" party (Re: "Obama and Romney election apps suck up personal data, research finds"; tinyurl.com/993y4a5).

DJ

SDN's biggest hurdle: IT staffs

THE BIGGEST IMPEDIMENT to OpenFlow/OpenStack in the enterprise is the IT staffs themselves. The majority have built their expertise (read: market value) on their specific knowledge sets of Cisco products and protocols (Re: "SDNs: Love 'em or leave 'em?" tinyurl.com/8ltpj8b).

For service providers, this will allow them to do things in their networks they've been wanting to do but couldn't due to the limitations of the network vendors.

StartUpGuy1

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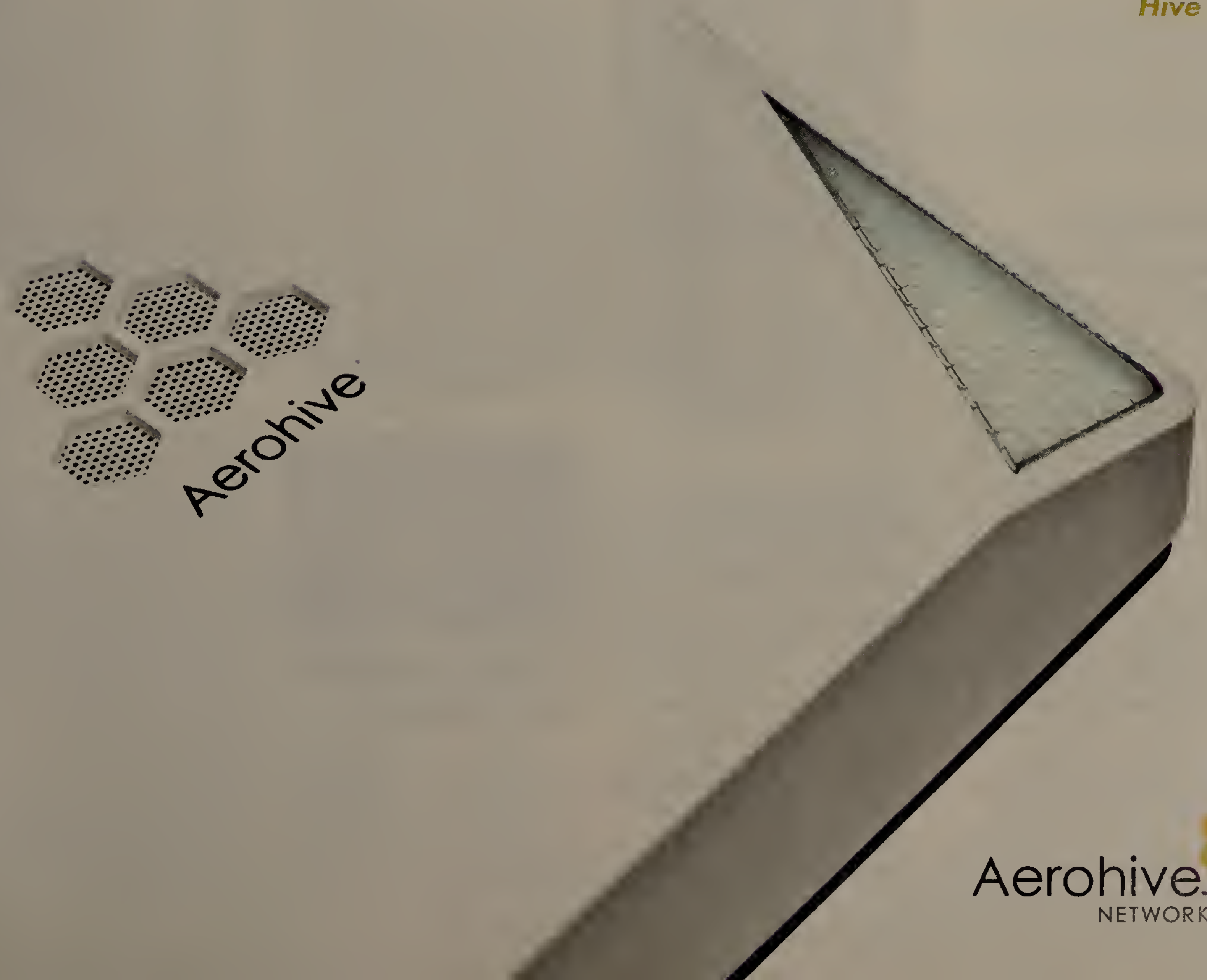

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IT VIDEO

Organizing Facebook friends

If you're suffering from Facebook friend overload, here are some ways to help organize your contacts. ***tinyurl.com/cjr37sp***

Microsoft wants to "go big" in China

MICROSOFT IS PLANNING a sizable expansion in China, including new hires, more research for local requirements, and efforts to push cloud computing services to additional cities and provinces. As part of its so-called "Go big" strategy for China, Microsoft will up its employees in the country from 4,500 to 5,500 and boost annual R&D investment there (currently $500 million) by 15%. The investment is expected to help promote Microsoft's cloud offerings in China. It will also help as the company prepares for the upcoming release of Windows 8 and Microsoft Office 2013. ***tinyurl.com/c2dlhvp***

As Chrome turns 4, Google's browser in flux

AS GOOGLE celebrated Chrome's fourth birthday last week, a pair of Web measurement firms continued to argue about whether the browser is gaining ground or has stalled. According to Net Applications, Chrome's share of all browsers grew by a quarter of a percentage point to 19.1% in August. Meanwhile, rival StatCounter said the browser lost two-tenths of a point to slip to 33.6%. The dispute between the two firms about Chrome's market share grew heated in June after StatCounter claimed Chrome had slipped past Microsoft's Internet Explorer to take the poll position in the race for the world's most-used browser. By Net Applications' numbers, Chrome remains in third place, behind IE and Mozilla's Firefox. ***tinyurl.com/cu9hpuu***

Highest paid engineers in mobile tech

ENGINEERS WORKING on communications technology were paid a median salary of $135,087 last year, the highest in the profession, according to new IEEE-USA survey data. The lowest paid engineers, with a median salary of $107,820, specialize in energy and power engineering. Overall, engineers in electrotechnology and IT had a median income of $120,000 last year, according to data collected from more than 10,200 IEEE-USA members. The survey found a 1.7% increase in engineering and IT salaries in 2011, which is less than half the rate of the prior year's raise. ***tinyurl.com/c9tm6fs***

Cloud confusion rains ... er, reigns

THERE'S CONFUSION over the cloud, and not just in the IT world. One in three Americans surveyed said they believe "the cloud" is related to the weather, the top response given when asked to define the term. Only 16% said the cloud is a computer network used to store, access and share data from an Internet-connected device, according to research sponsored by Citrix. One in five respondents admitted that they've lied, pretending that they know what the cloud is in conversation when in reality they don't. Seventeen percent of respondents admitted to pretending to know what the cloud was when they were on a date, and 14% said they pretended to know what it was during a job interview. ***tinyurl.com/bvvfu3w***

Amazon unveils new tablets

AMAZON AIMS to light up the tablet competition with its new Kindle Fire HD tablets, including a model with LTE capabilities ($499), a model with an 8.9-inch screen that can display images at a resolution of 1920 by 1200 pixels ($299), and a 7-inch model ($199). The new Kindle Fire HD devices bring new features, including a larger screen, more storage and mobile broadband capabilities, compared to the original Kindle Fire, which was announced in September last year with a 7-inch screen. The new devices have a faster processor and a front-facing camera, which was not available in the original Kindle Fire. The new devices also have an HDMI port so the tablets can be connected to high-definition TV sets. ***tinyurl.com/9ydg6cw***

Cisco modifies licensing for UC platform

CISCO IS modifying the licensing options for its Unified Communications Manager in an attempt to simplify the process and make the use of a variety of client devices easier. For starters, Cisco is removing the requirement that UC licenses be anchored to the acquisition of Cisco IP phones so customers can now interact with the Cisco telephony platform via devices such as PCs, tablets and smartphones. Cisco also has revamped its Enterprise Licensing Manager application to make it easier for customers to manage UC licenses and consolidated its UC bundles from eight to three. ***tinyurl.com/8dato6v***

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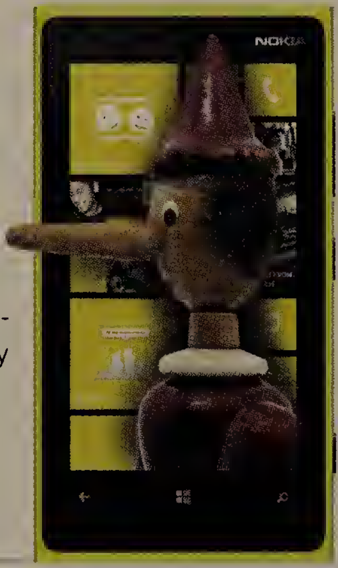
GOOD **BAD** **UGLY**

Real deal on mobile speeds

good

THE FCC is getting ready to measure mobile data speeds in a joint project with major carriers and other participants. At an upcoming meeting, FCC staff will discuss methods for testing mobile service and for remotely acquiring and analyzing performance data. Mobile operators make a variety of claims about the speeds that their networks offer, but there is no formal system for determining or disclosing the actual performance of those networks.

Pi-Nokia caught in a fib



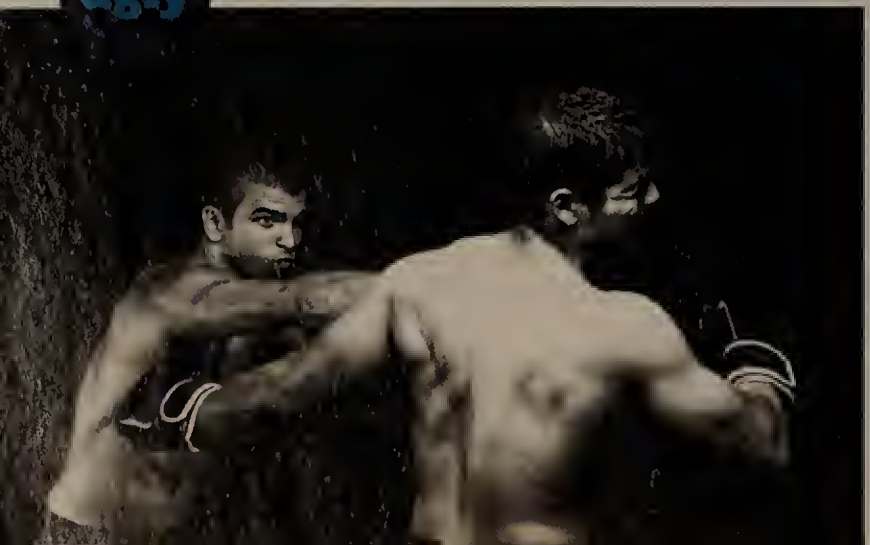
bad

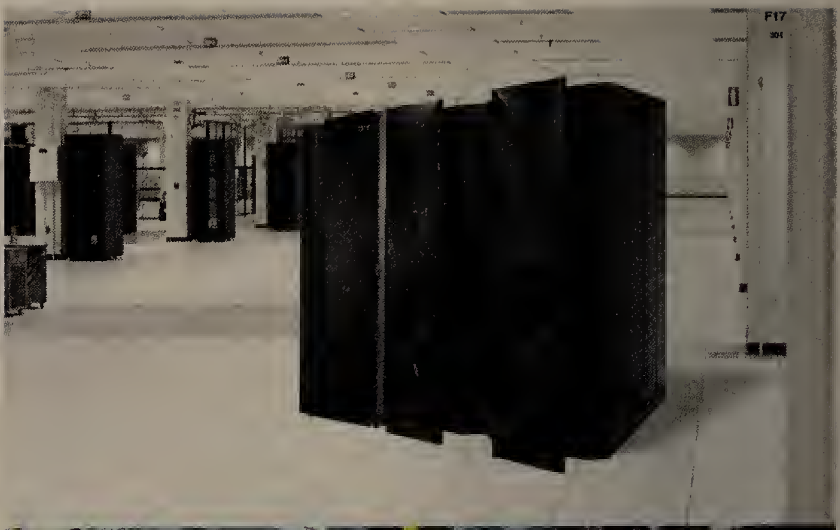
NOKIA OFFICIALS' noses grew a few inches this week as they were caught fibbing, after tech bloggers spotted a cameraman capturing a video the company claimed was shot with its new, highly touted Lumia 920 smartphone. After apologizing, Nokia posted a real video shot with the smartphone, displaying the optical image stabilization (OIS) camera technology that was faked on the first try. In the original video, the company claims its main fault was failing to publish "a disclaimer stating this was a representation of OIS only."

Virus vs. Trojan

WHEN MALWARE infects a machine it usually goes after the system software. But in a rare case worked on by SpiderLabs, researchers found a Trojan that had been infected by a virus (a variant of Sality), leaving both still functioning as normal. The two pieces of attack code were found on a single point-of-sale machine owned by a client of SpiderLabs, which removed them and put the machine back into use. An investigation is ongoing into how the malware got there in the first place.

ugly





IBM pumps up mainframe speed, capacity

WHAT CAN $1 billion in IBM R&D efforts do for Big Blue's mainframe family? Yield a system that's 25% faster and has 50% more capacity than the current high-end machine, according to the company. The newly announced zEnterprise EC12 features 5.5-GHz six-core processors, 101 cores (vs. 80 on the current z196), 3TB of memory, and a radiator-based air-cooled system. New features include: the ability to use IT systems analytics to automatically improve system health and performance; a tamper-resistant cryptographic co-processor called Crypto Express4S that provides privacy for transactions and sensitive data; and the addition of internal solid-state memory technology that's designed to improve the performance of data intensive applications. ***tinyurl.com/9nw7w8a***

Microsoft urges long-overdue security upgrade

MICROSOFT IS taking advantage of a light Patch Tuesday (just two security bulletins will be issued this week) to urge customers to upgrade their security keys so they don't wind up having trouble with Outlook, Exchange and other Microsoft applications. The company says businesses that haven't done so should see if they're running any applications that use RSA certificates smaller than 1,024 bits, because starting next month, updated Microsoft applications won't accept them. The result will be that certificate authority services won't work, making it impossible for applications to reach other resources that require the certificates. Internet Explorer will deny access to Web sites with smaller keys, Outlook 2010 won't encrypt email, and Outlook won't be able to connect to Exchange servers. "[T]his could be a serious issue for a lot of companies because when it breaks your software, it breaks it in a big way," says from Paul Henry, a security and forensic analyst at Lumension. tinyurl.com***/97td4rx***

Security question #21

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EXECUTIVE VIEWPOINT

Tim Golden

RESIDENT CHIEF TECHNOLOGY OFFICER FOR THE AMERICAS INDUSTRY STANDARD SERVER BUSINESS AT HEWLETT-PACKARD

In this role, he acts as the primary liaison between HP's customers and its ProLiant platform development teams. With 30 years of industry experience at HP, Compaq, Dell, and Apple, Tim brings a comprehensive and thorough understanding of technology trends and emerging product opportunities and has developed a unique ability to convey complex technical advantages into practical business benefits.

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Autonomics in IT

Next-Gen Servers Stress Intelligence and Automation

Hewlett-Packard has been assessing what trends like virtualization and cloud computing mean to its customers. We spoke with HP executive Tim Golden about the demands such trends place on application servers, and how HP has embedded intelligence and increased automation in its next-generation platforms in response.

What types of manual IT tasks can be automated?

Servers need to be more innovative, more intelligent and more self-sufficient given that 51 percent of server outages are linked to human intervention or error. For instance, what if we could, through clever engineering, fix problems that servers or server administrators might otherwise trip up on? One example involves monitoring for multi-bit errors in memory. If we can identify a 2-bit memory error we can automatically fix it on the fly without interruption of service. Another example is an LED light scheme on the hard-disk drive carrier that is designed to not only convey general health status, but also visually identify and isolate failed drives from good drives within RAID sets. That eliminates another relatively common human error.

> We're seeing 6 times performance gains compared to previous-generation servers.

How can server performance improve to meet the demands of enterprise applications, virtualization, and cloud computing?

One way is by addressing the imbalance that exists between processors, memory and storage. Over the last five to six years, storage performance hasn't kept pace with the performance advances we've seen in multicore processors and in DDR memory. One example of how we've addressed this performance gap is by fine-tuning the algorithms associated with solid-state drives and our new Smart Array controllers. Through such methods, we're seeing 6 times performance gains compared to previous-generation servers.

When looking to reduce energy costs, is it practical to consider higher-performance servers?

It makes perfect sense. With the new-generation platforms running the newest advanced processors, we're seeing performance gains upwards of 50 to 200 percent depending on the workloads. And thanks to the energy-saving techniques we've implemented, we're delivering as much as 70 percent more compute per watt than even our last generation, which was a quantum leap over earlier generations.

Doesn't the increased complexity make next-gen servers more difficult to service?

No; we've introduced many features to make them easier and faster to service. We've also done many things to make them more reliable. That includes equipping servers with an Active Health System that monitors 1,600 different health and configuration parameters 24 hours per day, 365 days per year. That information is stored for one year, and can be used to recover much faster from any problems that do occur. Product engineers can also build more reliable servers by looking at the correlation between component failures and configuration data.

It sounds as though HP committed significant resources to creating the ProLiant Gen8 portfolio.

It was a 2.5-year development effort, with a $300 million budget. We now have some 917 patents that are either granted or pending related to Gen8 and its immediate infrastructure. There are no fewer than 150 unique features on Gen8 servers that didn't exist in our previous generation. If that doesn't address escalating server demands, I don't know what will. ■

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New smartphones spotlight the enterprise

BY JOHN COX

NEW SMARTPHONES last week from Nokia-Microsoft and Motorola-Verizon-Google, with Apple's iPhone expected this week, shed light on how mobility is evolving for enterprise IT groups. The focus has been less on hardware razzle-dazzle and more on what the phones can do as mobile computers.

The new Motorola Droid Razr models will support the latest version of the Android OS, Jelly Bean, when they ship later this year. And, for the first time, Google's Chrome Web browser is included as the phone's standard. Nokia's new Lumia models, running the not-yet-released Windows Phone 8 OS, feature new levels of integration with the Nokia Location Platform, now built into Window Phone, and new apps, like the augmented reality browsing in Nokia City Lens, to exploit these services.

Most of the new phones support 4G/LTE cellular connectivity (with a fall-back to 3G), providing a much bigger, always available, wireless data pipe at least for those subscribers who want it. And enterprises can expect that pipe, as well as 802.11n Wi-Fi links, to be used for high-definition imagery and video transfers. Diagonal screen sizes range from 4.3 to 4.7 inches. All of them feature "only" dual-core processors rather than the quad-core chips found in a few high-end phones, an acknowledgement of the complex trade-offs that good mobile device design requires.

The most notable hardware feature in the new Motorola phones is the much longer battery life, says Michael Morgan, senior analyst, mobile devices, for ABI Research. But the greater significance lies in how these mobile devices from Motorola Mobility, acquired by Google last year, fit into the growing constellation of Google services. "Motorola will be the vehicle that is used to ensure that there are Android devices on the market that leverage Google services, such as maps and email," Morgan says.

Steve Patterson, writing *Network World*'s PhilAndroid blog, argues the new Motorola phones are "customer acquisition platforms that attract and engage consumers with the untethered mobile capability to run data-intensive applications like Google Maps, Facebook, YouTube and Skype in the way they would ordinarily run only on PCs or on Wi-Fi-connected mobile devices."

The new Windows 8-powered Nokia Lumia 920 and Motorola's new Droid Razr smartphones

"This mobile platform consisting of data-intensive applications, compelling preloaded Google apps, fast un-tethered browsing and long battery life is game changing because it captures customers and increases the amount of mobile data intensive application time displaced from PCs (including Macs)," he writes.

Nokia did emphasize hardware features to differentiate its second-generation Lumia phones: new display technology that minimizes motion blurring and boosts brightness in sunlight, wireless recharging based on the Qi standard and, on the higher-end phone, a greatly improved camera and more powerful battery. But what makes the camera effective is the way it leverages both new editing features in Windows Phone 8, along with new third-party apps, and the accompanying free 7GB storage account on Microsoft's SkyDrive cloud storage service.

Nokia is currently the leading Windows Phone vendor in the U.S., but that's not actually saying much, as one analyst notes. "Despite recent gains, Windows Phone is not yet performing to Ovum's expectations," says Tony Cripps, principal analyst, devices and platforms, at Ovum, a technology market research firm.

Cripps has a novel thesis about why. "This is, at least, partially as a consequence of the strength of the opposition [iOS and Android], but partly, we think, as a deliberate move by Microsoft and its hardware partners to avoid flooding the market too quickly with the platform before they are in a position to play up its synergies with other Microsoft products, especially Windows 8 for PCs and tablets [due out this fall], and its business applications," he says. "The clear benefits to businesses from the ready integration possible across Microsoft's products set will set a benchmark for BYOD strategies focused on out-of-box device capabilities once Microsoft's full range of new platforms is available."

But what this integration will entail, or what synergies it will achieve (or at least promise), and in what time frame, all remain mysterious in light of Microsoft's continuing silence about its priorities for the mobile enterprise.

Ovum's chief telecoms analysts, Jan Dawson, argues that by extending the distinctive user interface of Windows Phone into Windows 8 on tablets and notebooks, Microsoft paradoxically will make Windows Phone more familiar to a much larger audience. Another synergy is the now-shared kernel in Windows 8 and Windows Phone 8. That means "developers can develop for PCs, tablets and smartphones in a unified way, which should help developers get on board with Windows Phone, and that in turn should make the platform more attractive," Dawson says.

That's a view echoed in a blog post by VentureBeat's Devindra Hardawar, who argues that with the advent of Windows 8, Windows Phone "will no longer feel like an outlier among Microsoft's products. Windows 8 finally wraps up everything Microsoft is doing — desktops, smartphones, tablets, and even the Xbox's new interface — into one cohesive computing experience."

Windows 8 is what will "truly differentiate Windows Phone for the upcoming year," he says. "That's important, because the [mobile] platform has suffered from being only slightly more convenient and prettier than its competitors. If Microsoft can market Windows Phone 8 as an extension of Windows 8, it could finally make consumers pay attention."

As Hardawar points out, that's not something that Google or even Apple, which has been importing the look and feel of iOS into its desktop/notebook Mac operating system, can offer, or at least offer in quite the same way.

The new phones show that mobile devices are less like personal computers and more like personalized service endpoints that smoothly and efficiently interconnect with a growing range of back-end services, either on the Web, in various clouds, or behind the firewall of the enterprise. ■

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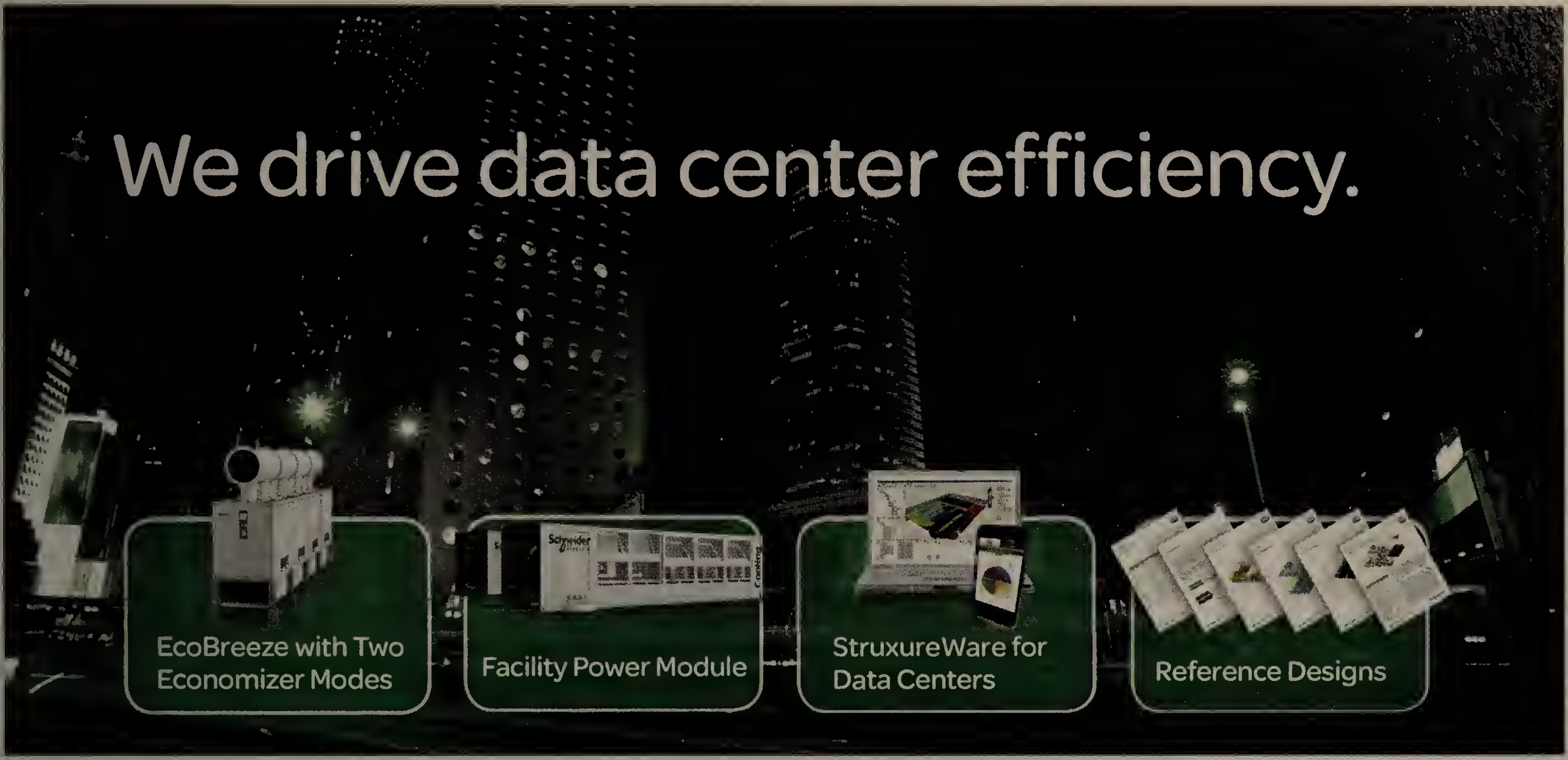
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▶ **BYOD,** *from page 1*

offered the option of BYOD on a voluntary basis and with a subsidy to keep it "cost-neutral" to whatever corporate-issued device BYOD is expected to replace, says Rick Varju, director of engineering and operations there. He says this "whole consumerization of IT craze" basically got rolling because the firm's CIO got an iPad.

But due to concerns about security and compliance, IT departments are making their own demands on BYOD users — often asking them to agree to give IT control over their personal smartphones and tablets. IT is requiring the users to install corporate-issued management and security software to monitor or remote wipe — and sign off to accepted practice in BYOD policies.

John Pironti, president of consulting firm IP Architects, who has advised security association ISACA on BYOD security issues, contends the legal questions are usually harder to answer than the technology ones.

When it comes to corporate data at risk, Pironti says BYOD is "about liability." In some places, BYOD should be rejected because it's too big a risk, or it's deemed that the user's privacy will be violated. Either way, he warns, don't think a personally owned device won't be subject to regulatory-driven audits just like corporate devices.

At Burr Pilger Mayer, it is viewed that BYOD devices have to be audited just like any corporate-issued device would. So employees eager to go BYOD have to agree to use the necessary MDM software and services, which includes Fiberlink MaaS360. They must adhere to specific iOS and Android types — and definitely not "jailbreak" their Apple smartphones to disable security (which the firm says it would know about immediately). Each BYOD user also has to sign two policy documents regarding accepted practices and the company's requirements.

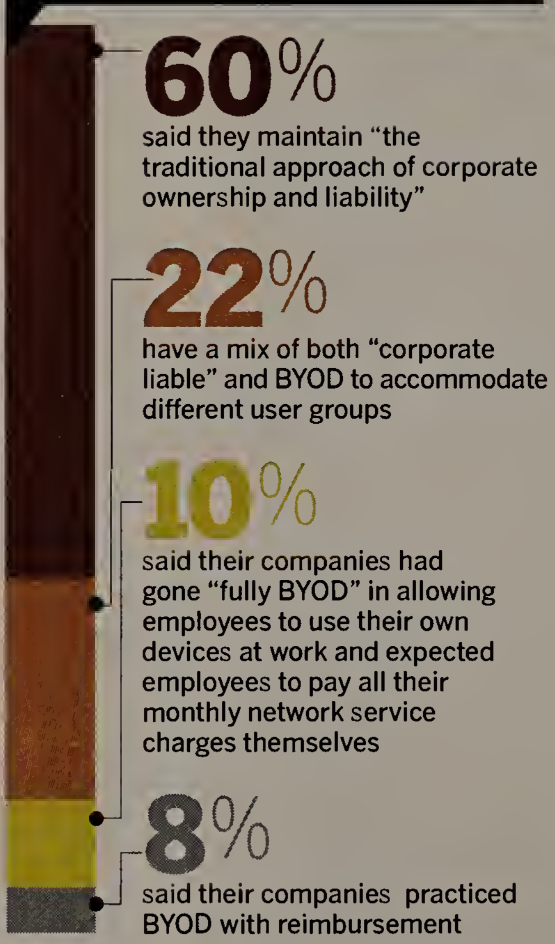
"It states you agree the firm can wipe the device," says Peters, adding the accounting firm also affirms the right to randomly monitor the device. But all these measures don't totally put to rest unease about the invasion of consumer devices into the corporate world.

Indeed, some businesses have put up the "keep out" sign to BYOD — at least for now.

"I'm not comfortable with BYOD," says Brad Hillebrand, director of enterprise technology at paint and protective coatings manufacturer Rust-Oleum. "I don't want corporate resources on devices we don't own."

Instead, Rust-Oleum, which uses GroupLogic for mobile-device secure file-sharing, has started issuing iPads and iPhones to employees and telling them the devices now allow personal data use "in a personal-security mode."

A survey asked 116 information technology and telecom professionals **how they feel about BYOD**



SOURCE: SURVEY "MOBILITY TEMPERATURE CHECK: JUST HOW HOT IS BYOD?" RESEARCHED BY CCMI FOR XIGO

This mode is enabled by software from MobileIron and AirWatch that separates usage into business and personal. "Rather than BYOD, we're providing the personal mode," Hillebrand says. While users seem happy about the system, Hillebrand acknowledges it does add cost and managers get monthly reports to see how "personal mode" is faring, especially in terms of wireless data-service plans.

Some organizations these days believe that BYOD is a way the corporation can save money by not buying corporate-issued mobile smartphones or tablets at all for employees.

That's the idea at networking giant Cisco, at least regarding smartphones. The company doesn't supply smartphones to employees anymore, unless their job falls under government regulatory restrictions where it's plainly spelled out that the employees must be using corporate-issued devices, says Steve Martino, vice president of information security at Cisco. This requirement comes not only from the U.S. government for classified work, but from foreign governments, too, he points out. BYOD at Cisco is basically about trying to lower costs, but Martino argues that Cisco sees measured productivity gains of about 30 minutes per day per employee through BYOD.

A recent survey of 116 IT and telecom professionals regarding BYOD found that nearly a quarter of them that allowed BYOD in their organizations said mobile capital expenditures had actually increased by more than 20%. However, the survey found that 60% of the respondents said they adhered to "the traditional approach of corporate ownership and liability," while 22% had a mix of both "corporate liable" and BYOD to accommodate different user groups. One in 10 said their companies had gone "fully BYOD" in allowing employees to use their own devices at work, and expected employees to pay all their monthly network service charges themselves, while another 8% practiced BYOD with reimbursement.

The U.S. federal government has not yet opened the gates to BYOD, and is undertaking a close look at how security and MDM should optimally be implemented. The National Institute of Standards and Technology (NIST) published a draft policy proposal in July that suggests BYOD is inherently riskier than use of corporate-owned smartphones and tablets.

But a number of states and local governments already are in the middle of BYOD initiatives.

The city of Minneapolis, for example, offers the option for BYOD in some circumstances. "My iPad is my personal one, but I'm allowed to use the city network," says city CIO Otto Doll. While the idea of BYOD is fairly new, he says it strikes him that the trend simply represents an evolution of the idea of how home computers came to be used to access corporate data, and when it comes to data security, you have to rely quite a lot on an employee's "sense of professionalism" and training on how data should be treated.

In the city of Wichita Falls, Texas, there are plans being worked out to support BYOD, possibly in the municipal court system for the convenience of attorneys and others, says Patrick Gray, system application analyst for the city.

And in Mississippi, BYOD is allowed in the prison system under certain circumstances, says Jerry Horton, IT network manager for the Mississippi Department of Corrections.

But not directly around inmates or for inmates. "Inmates is a definite big 'no,'" he clarifies, noting more than 4,000 phones are confiscated every year, brought in by relatives or "thrown over the fence."

Horton says his department does accept requests for BYOD from agency employees,

▶ *See* **BYOD,** *page 22*

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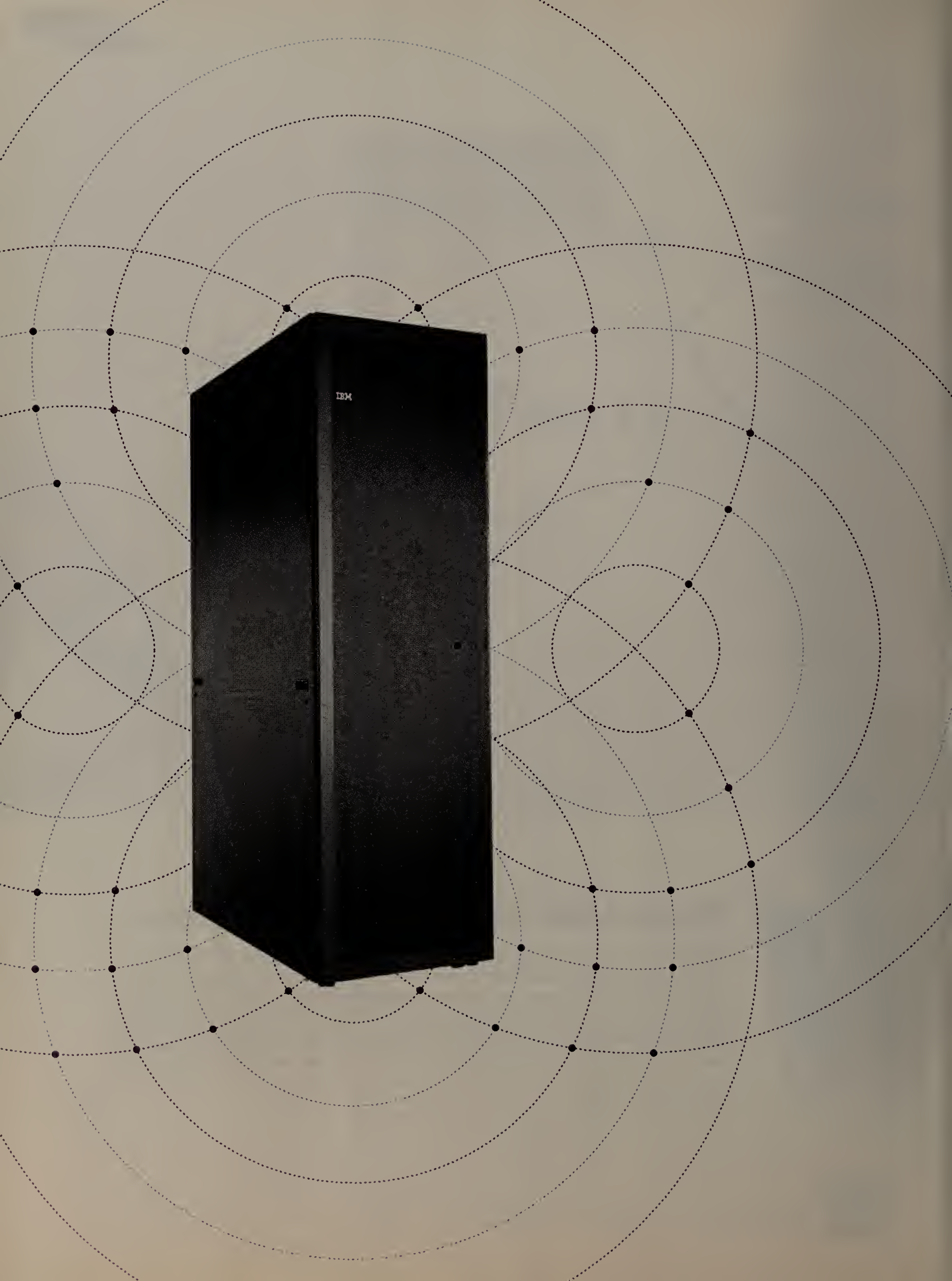
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Windows Server 2012 embraces the data center

BY JOAB JACKSON, IDG NEWS SERVICE

MICROSOFT HAS taken its server OS a giant step forward with last week's release of Windows Server 2012, making this version the first that can be controlled remotely so it is more suitable for data centers.

"Microsoft has delivered on the promise of an operating system that can be completely managed from the command line," says Don Jones, an author of a series of Windows 2012 instructional videos that have been released by the training firm CBT Nuggets. "The technologies are in place to manage 100 servers as easily as you can manage one server."

The first major upgrade since 2009 features a bevy of new features, most designed to make it more suitable for large-scale data center deployments. Satya Nadella, Microsoft president for Server and Tools, has touted this release as Microsoft's "Cloud OS."

The Hyper-V virtualization can now support up to 64 virtual processors and 1TB of memory for guests, compared with the old limit of four virtual processors and 64GB of memory. The Server Message Block (SMB) network communication protocol has been updated to handle faster data transfers and the OS's Server Manager has been updated to handle multiple servers at once.

But perhaps the most significant enhancement is one that may not be noticed among these flashy new features. Thanks to the inclusion of the PowerShell, first introduced six years ago, this will be the first version of Windows Server that can be completely controlled through the command line, making it controllable remotely.

PowerShell provides the Windows similar capabilities that chief competitor Unix has long offered, such as the ability to forward, or pipe, the output of one process to the input of another process. It even adds a few new tricks, such as the ability to handle software objects, which have come about from studying Unix's limitations. "It is an incredibly well-designed shell," Jones says.

Of course, the GUI is still available for those who require it, but "you can remove the GUI and it will be a fully functional server," Jones says. Doing away with the need for a GUI (graphical user interface) means that servers can be managed more efficiently in multiple numbers, Jones says. "If you are still using management techniques where you are still physically touching the server, you need to move to the 21st century and managing it like a server in a data center."

For instance, an administrator may now have to execute a routine task on a server once a week by clicking through a series of options on a graphical program. With the command line, the administrator can write a script in PowerShell to run though all of those steps automatically and that script can run against multiple machines. ■

▶ **BYOD,** *from page 18*

carefully evaluating how BYOD would help them in their jobs. There are no restrictions on mobile-device brands, but the employees do have to sign a form that agrees if they lose their smartphone, for example, it would be wiped. The SonicWall Aventail EX 6000 VPN gateway plays a role in helping define access to agency data resources for any mobile device. Some agency executives, investigators and probation parole officers, among others, have been granted BYOD privileges.

Doctor's order: Get me BYOD, stat!

Large healthcare systems with multiple hospitals and clinic locations are adopting BYOD in order to accommodate physicians with their own tablets who are on the go and want both hospital email and patient data — fast.

Erik Devine, chief security officer, information services, at Riverside Medical Center in Kankakee, Ill., says his healthcare organization today issues corporate-owned Apple and Android-based tablets and smartphones to employees. But many times physicians prefer to use their own tablets, he points out, because their jobs often take them from hospital to hospital, not necessarily even owned by the same organization.

Devine says his IT group supports BYOD for about 5% of the physicians active in the Riverside system. But BYOD doctors — who tend to adore Apple tablets, he says — have to install McAfee or AirWatch MDM software, and sign a waiver that would allow IT to wipe the personal device if it's lost. And jailbreaking iPhones is prohibited, although it does happen from time to time and is detected at once.

Upon jailbreak detection, the MDM software ensures network access ceases and the IT staff have to rush off to explain to the users why jailbreaking is not allowed and to get them started with BYOD again, Devine says. He adds BYOD is here to stay, but today it comes with a specific burden associated with keeping track of BYOD devices, which sometimes don't appear on the network for quite awhile. He adds his healthcare organization is also looking at ways it might be possible to "self-register" BYOD users.

Rick Copple, vice president and CTO at Community Health Network (CHN) in Indianapolis, also says BYOD is supported mainly to let hospital staff get corporate email today, under certain conditions.

Under a policy decided by CHN's IT department, the CSO, the CEO, and auditors and healthcare professionals requesting BYOD, these personally owned smartphones and tablets have to use the MOBI wireless device management service with the Good Technology client just as corporate-issued devices might, but designated as a BYOD.

If the device is lost, the healthcare organization has the ability to wipe the business email but not personal mail. The IT staff isn't officially providing tech support for BYOD devices in the same manner they would for corporate-issued devices. But as the hospital system begins its rollout of a new electronic-medical record system from vendor Epic, much change is anticipated as the healthcare organization is actively looking at various types of BYOD software to allow selective wipe and other features.

BYOD is "different"

"We've moved completely to BYOD," says Brad Pierce, network engineer at tax planning and accounting firm Horne LLP, mainly because of strong management support for it, with Google Android and Apple iOS devices managed via AirWatch and supporting mandatory encryption at rest. "We adopted Citrix Receiver as part of BYOD for tablets. It's a way to give users access to applications that we'd traditionally run on their laptops, in a secure manner on their smartphones and tablets."

Despite things working out with BYOD, there's still that slightly odd feeling about managing an employee's personal device. "We still do have the mindset these devices are different," Pierce says. "And the end user is acknowledging they are handing over a portion of this device we can control." ■

Startups rush to the cloud

Companies look to stake their claim, and access a tightening pool of VC funding

BY BRANDON BUTLER

HAVING A cloud computing startup has at times felt like being part of the California Gold Rush, says Nand Mulchandani, CEO and co-founder of ScaleXtreme, a 2-year-old company focused on easing management of multi-cloud environments.

Scads of entrepreneurs over the past few years have launched companies in an effort to grab a share of the riches they've seen companies such as Amazon Web Services, Rackspace and VMware reap. And why not? Forrester last year projected that the cloud computing industry will grow sixfold from $40 billion in 2010 to $241 billion by 2020.

Frank Artale, a venture capitalist at Ignition Partners, says the cloud represents the next major shift in enterprise computing, and that VCs are aggressively investing in cloud startups. "Initially this move [to the cloud] will create more complexity," he says. "Companies that can enable the use of cloud, virtual networking and storage will get lots of attention." Artale is among investors at Mulchandani's ScaleXtreme, which has raised $13.5 million.

Network World last week released its latest list of hot cloud computing startups, including ScaleXtreme, and these companies in total have raised more than $160 million — including one startup that itself has raised $60 million.

Peter Sonsini, managing partner at New Enterprise Associates (NEA), says investments in cloud companies are still "very robust" even though overall VC investments are down by about 20% from a decade ago.

There's been a shift in the type of cloud companies that VCs are funding, Sonsini says. The early days of cloud computing were about the infrastructure that makes the technology work. Now, investments are focused on optimizing how customers can use the cloud and better manage it. Sonsini, for example, sits on the board as an investor in Embrane, which Sonsini says was one of the original players in the software-defined networking market that has seen increased attention ever since VMware's $1.2 billion acquisition of Nicira in July. Embrane helps enterprises manage their SDN environments by virtualizing network application tools such as load balancers, firewalls and VPNs.

Out of the dozen companies featured in our hot cloud computing startup list, most have received less than $10 million in VC funding.

Part of the reality, Sonsini says, is that it simply takes less money to start a company now because entrepreneurs can leverage cloud resources.

Milind Gadekar, whose startup CloudOn has raised about $26 million, says a decade ago he would have needed nearly double the amount of money to start his company. By leveraging Amazon Web Services' cloud, CloudOn has not needed to buy back-end infrastructure to support the company, which makes an application for accessing Microsoft Office tools on mobile devices. Other companies are bootstrapping the operations themselves. OneOps, for example, aims to make application development and deployment easier, and the three former eBay engineers that started it have invested their own money in the project for starters.

Sonsini says after the Internet bubble of the early 2000s the VC community got too inflated with lots of new investors coming into the market and throwing around a lot of money. The contraction of recent years has somewhat right-sized the market to a level where he believes there are an appropriate amount of startups being funded to not saturate the market, but to still allow promising ideas to flourish. We'll see just which ones make it big in the cloud computing realm. ■

12 HOT CLOUD COMPUTING COMPANIES TO WATCH

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FOCUS Redis and Memcached NoSQL database optimization and management

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FOCUS Enterprise storage and secure data management platform

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FOCUS Amazon Web Services monitoring, optimization

OneOps
FOCUS Former eBay engineers created application development and deployment platform

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EXECUTIVE VIEWPOINT

Bill Versen
DIRECTOR, MOBILITY
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Bill is responsible for the development, management and marketing of the mobility solutions portfolio that enables customers to securely manage mobile endpoints providing anytime-anywhere access to business resources and applications.

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"Bring Your Own Cloud" Brings its Own Set of Challenges

If IT departments aren't worried about employee use of personal clouds, they should be. A May 2012 study by the Fraunhofer Institute for Secure Information Technology in Germany found that the security of many consumer cloud storage providers is unreliable. In fact, none of the cloud providers met the Institute's security requirements. In some instances, security was so weak that confidential data could've been uncovered by a simple Web search, said the Institute.

Verizon's Bill Versen speaks about the growing bring-your-own-cloud (BYOC) phenomenon and how IT can cope with it.

Why is BYOC a problem?

It's simply the next step in the consumerization of IT. First, employees prefer using their personal devices for business. Meanwhile, they also use consumer cloud-based storage services, like Dropbox, and cloud-based social networks, like Facebook, in their personal lives. They are familiar with these services, and think nothing of sharing a PowerPoint from work by putting it up on Dropbox. The challenge is, you just took company information and put it in a public cloud. It's the same with some of the social networking platforms, where people are sharing photos and documents.

> "They are familiar with these services, and think nothing of sharing a PowerPoint from work by putting it up on Dropbox."

What are the biggest dangers?

These sites do not have what many IT managers and CIOs consider enterprise-level security. In fact, IBM recently decided to ban the use of Dropbox as part of its BYOC policy, because it was concerned about the potential for exposure of confidential corporate information. On top of exposing confidential business information and trade secrets, there are a number of regulations that can be violated by putting information in a public cloud. If a nurse practitioner shares X-rays by putting the image files up on Dropbox, for example, that violates the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Exposure of customer billing information on a public cloud violates Customer Proprietary Network Information (CPNI) regulations. In the U.S. government, Global Access Rights Management (GARM) regulations require that information stay on U.S.-based servers, and putting something up on a consumer cloud means it might be going to a server based overseas.

What steps can IT take to regain control?

In many cases, the situation has become complex to manage. With BYOD, corporate IT departments started to use mobile device management to secure both corporate and personally-owned devices. Some have also implemented dual-persona technologies, which isolate personal applications and information from business apps and data on the same device. With all the potential solutions, choosing technologies and implementing an overall strategy can be complicated. With BYOC, not only are consumer services spilling over into the workplace, but some business applications have started adopting features that combine social networking or cloud storage with enterprise-level security. Salesforce.com, for example, has a blogging and social-networking platform with its CRM package, called Chatter. Without a mobile strategy, users will turn to the consumer cloud with no guidance, which could jeopardize company information.

How can Verizon help?

Verizon recommends managing the user policy rather than the technology. We can help companies develop a strategy to mobilize their business, then leverage our mobility solutions to apply the technologies that can accomplish that goal. From self-service to fully managed, on-premise to secure cloud, Verizon has solutions to ensure that IT needn't worry about BYOC, but can focus on the user and their business.■

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Defining software-defined networking

IT execs need to understand the benefits of this radical shift in network technology

BY JIM METZLER, NETWORK WORLD

AS IS somewhat typical of emerging technologies, there isn't a universally agreed-to definition of what is meant by software-defined networking (SDN). Over the last year or two most of the definitions have focused on the decoupling of the network control plane from the network forwarding plane.

Decoupling of the network control and forwarding planes isn't a new concept. It's a key feature of MPLS and it is also a characteristic of many contemporary Wi-Fi networks. However, if SDN is looked at strictly as the decoupling of the network control plane from the network forwarding plane, then its value is limited to features like reducing network latency.

The definition of SDN that is currently emerging focuses **somewhat less on decoupling** and **more on providing programmatic interfaces into network equipment.**

The definition of SDN that is currently emerging focuses somewhat less on decoupling and more on providing programmatic interfaces into network equipment, whether or not there is a separation of the control and forwarding planes. A minor reason for this shift in focus is that Cisco recently announced that, as part of its SDN offerings, it will provide APIs into multiple platforms that they provide.

This is not a Cisco-only approach, as other vendors — including Arista, Extreme and Juniper — currently provide direct access to their products. One advantage of this approach is that it enables very detailed access into, and control over, network elements. This approach, however, doesn't provide a central point of control and is vendor specific. While some network service providers may adopt this approach in the near term, it is unlikely to gain much traction in the enterprise market for the foreseeable future.

A more powerful reason for the shift in focus of the definition of SDN is that if SDN is looked at as providing programmatic interfaces into network equipment, then its value is much broader. Looked at this way, SDN allows IT organizations to replace a manual interface into networking equipment with a programmatic interface that can enable the automation of tasks such as configuration and policy management and can also enable the network to dynamically respond to application requirements.

The group most associated with the development of a standards-based SDN is the Open Networking Foundation (ONF). The ONF was launched in 2011, and its vision is to make OpenFlow-based SDN the new norm for networks. To help achieve that vision, the ONF has taken on the responsibility to drive the standardization of the OpenFlow protocol. The breadth of the SDN ecosystem is reflected in the fact that the ONF currently has more than 70 members of varying types including vendors that provide the enabling silicon as well as the switches, network appliances, controllers, test equipment, telecommunications services, hyper-scale data center services and smartphones.

In a layered architecture for an SDN the control plane features are centralized in the SDN controller's software. Most of the time that SDN is being discussed, the OpenFlow protocol is used to program the forwarding behavior of the switch. There are, however, alternatives to the use of OpenFlow, including the Extensible Messaging and Presence Protocol (XMPP), the Network Configuration Protocol (Netconf) and OpenStack from Rackspace and NASA.

In this model, applications are written to a set of APIs that are provided by the SDN controller. Unfortunately, these APIs are not standardized, so an application that runs on a given SDN controller would have to be modified to run on another SDN controller.

The SDN controller supports a number of drivers that control the behavior of the underlying network elements, so that the network will provide the desired network services. The controller provides management plane functionality such as performance and fault management via SNMP and other standard protocols, and it typically handles configuration management of OpenFlow-compliant devices in order to provide network topology, forwarding, QoS and link management.

With OpenFlow, a single central controller can program all the physical and virtual switches in a network. While it is possible to implement SDN with a single controller, vendors such as Big Switch and NEC have announced either a production high-availability cluster, or their intention to implement such a cluster of controllers. It is likely that IBM will follow suit.

The OpenFlow protocol was developed at Stanford, with Version 1.0 published at the end of 2009 and v1.1 at the beginning of 2011. In March 2011, the ONF was created and the intellectual property rights of OpenFlow were transitioned to it. Part of the ONF charter is to control and commercialize OpenFlow. With that goal in mind, the ONF recently released OpenFlow v1.3 and in March 2012 the ONF sponsored an interoperability event that was open to all of the members of the ONF.

In an OpenFlow-only switch, all of the control functions of a traditional switch (e.g., the routing protocols that are used to build forwarding information bases [FIB]) are run in the central OpenFlow controller. An OpenFlow-enabled switch (dubbed an OpenFlow-hybrid switch in v1.1) supports both OpenFlow flow forwarding and traditional Ethernet switch bridging and routing. Hybrid switches allow OpenFlow and traditional bridge/routing to share the same Ethernet infrastructure.

Many existing high-functionality Layer 2/3 switches can be converted to be OpenFlow-hybrid switches by the relatively simple addition of an OpenFlow agent in firmware supported by the native switch network operating system (NOS). Alternatively, once the semiconductor vendors have produced chips that effectively process the OpenFlow protocol, an OpenFlow-only switch would be extremely simple and inexpensive to build because it would have very little resident software and would not require a powerful CPU or large memory to support the extensive control functionality typically packaged in a traditional NOS. ■

Metzler heads Ashton, Metzler Associates. He can be reached at jim@ashtonmetzler.com.

TOOLS

Is it a phone? Is it a tablet? No! It's a phablet!

If there's one thing that annoys me it's the obsessive miniaturization of electronic products. Although I don't have anything like RSI or arthritis or poor motor skills, with most teeny digital devices my fingers become inaccurate banana-like appendages stabbing at the minuscule keys with a success rate of maybe 50% at best.

Mark Gibbs' Gearhead

Even the iPhone is on the edge of usability. If I want good accuracy when using the iPhone's on-screen keyboard I have to rotate the phone into landscape mode so I get bigger virtual keys to stab at. And don't get me started on the iPhone screen! Sure, it's got great resolution if you're 20 years old and have 20/20 eyesight. For the rest of us it's "where did I put my glasses?" (which is always a problem because finding your glasses when you're not wearing them can be, shall we say, challenging).

Why does everything have to be so tiny? Despite coming from the land of obsessive miniaturization, the product designers at Samsung figured out that not everyone wants tiny, so they produced the Galaxy Note.

The Samsung Galaxy Note is a hybrid that is half phone, half miniature tablet, a combination described by some publications as a "phablet" (one of the most horrible portmanteau words ever coined).

Let's compare the Samsung Note to the iPhone: The iPhone 4S is 4.5 inches tall by 2.31 inches wide by 0.37 inches thick, weighs 4.9 ounces, and has a 3.5-inch diagonal screen with 960-by-640-pixel resolution at 326 ppi. The Note is 5.78 inches tall by 3.26 inches wide by 0.38 thick, weighs 6.3 ounces, and has a 5.29-inch diagonal Super AMOLED screen with 800-by-1280-pixel resolution at 285 ppi.

While the iPhone's screen is, indeed, fabulous, so is the Note's, despite its lower pixel density (I love those AMOLED displays . . . the colors are great).

Other than those attributes, the main differences are in the operating system (the Note runs Android "Ice Cream Sandwich"), Note's inclusion of the excellent Swype keyboard, and the Note's focus on pen input. The Note has a bay on the bottom that stores the included stylus which Samsung is pleased to call the "S Pen." This stylus includes a shift button to invoke various functions depending on the software it is used with.

While the pen input is good for navigation and kind of useful for taking notes, writing on the Note still feels wrong. There's not the right amount of drag on the pen tip so it feels like writing on glass rather than paper. Will anyone ever get this right?

The Note comes with an optional free collection of apps in a sort of mini embedded app store from Samsung that requires agreeing to a separate license and establishing a separate account with Samsung. Given that the device runs Google's operating system, how hard would it have been to use Google's OAuth rather than a completely separate login?

Overall I like this product. The performance is great, the display is great, and its nice to have a device I can see without glasses. On the other hand, as a phone it feels odd. It's a little uncomfortable and, if you have small hands, it will probably be too big.

For some people this phone will be just what they're looking for, while, for others, its size will probably make it a little too weird to be comfortable. Priced at $250 with a two-year contract, or $749 without a contract, the Samsung Galaxy Note gets a Gearhead rating of 4 out of 5. Obviously when it comes to price, there's not enough focus on miniaturization. ■

Gibbs is vision challenged in Ventura, Calif. Tell him at gearhead@gibbs.com what you see and follow him on Twitter (@quistuipater) and on Facebook (quistuipater).

Gibbs gave the Samsung Galaxy Note high marks despite his issue with phones this small.

GADGETS

Tiny MP3 player falls short; CableStrip a solid choice

Keith Shaw's
Cool Tools

THE SCOOP

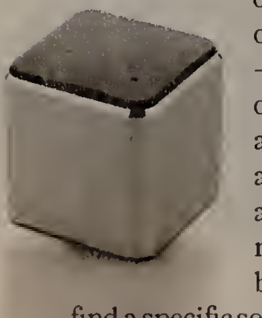
The Kube 2

by Bluetree Electronics,
about $40 (via Amazon.com)

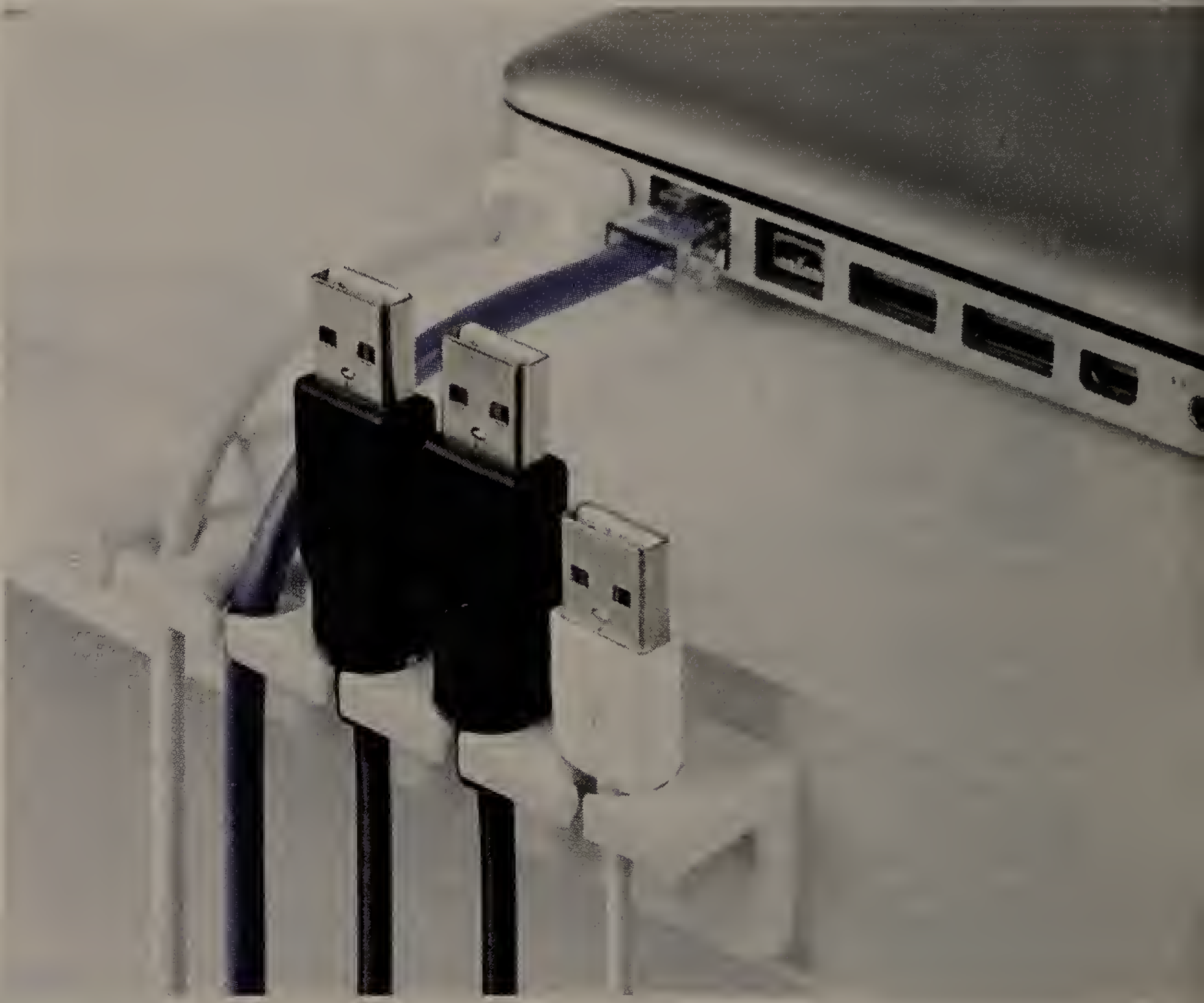
▶ **What it is:** Billed as the "smallest touch MP3 player in the world," the Kube 2 is a digital music player constructed in the shape of a cube (imagine if you took one die from a board game and doubled its size). The Kube 2 has no buttons or screens — instead, you use your finger to touch the top of the device and either hold it or swipe it left/right/diagonally in order to select songs, raise/lower the volume or power it on/off. The unit has no internal memory, but comes with a 4GB MicroSD card for music storage. It supports MP3, WMA, WAV and MIDI files, and it also includes a USB adapter for the MicroSD card, a pair of earbud headphones with flat cords that tangle less, and a USB charging cable (it charges via the headphone jack).

▶ **Why it's cool:** It's nice to see some digital music player options for users that aren't made by Apple — the Kube 2 is smaller in height than the iPod Nano, but the cube shape makes it thicker. Each unit also comes with a unique sticker "skin" that you can wrap around the Kube 2 to personalize it, and you can buy additional skins through the company's website.

▶ **Some caveats:** I wasn't thrilled with the touch interface — there's a lot of trial-and-error required to get the right feel for how long you hold your thumb, and which direction to swipe in order to do things like powering it up or switching songs. Your two options for listening are either shuffle mode or listening to songs in the order on the memory card — listening to specific artists or album or playlists aren't available. If you are good about loading your music in a specific order, you might not mind these limitations, but it could get tedious to find a specific song with the swipe actions required. There's also no strap or way to clip the device onto clothes for working out.



▶ **Grade** ★★⯨ **(out of five).**



THE SCOOP

CableStrip

by Rockpool Designs, about $10 (for a pack of two)

▶ **What it is:** This cable management system is a small bracket with five small holes that can hold cables for your computer, TV, stereo or other consumer electronic gear. The CableStrip uses high-strength tape that can bond on the side of a desk (it's not recommended for painted walls or porous surfaces), providing a solid support for the cables and making the desk area slightly less cluttered.

▶ **Why it's cool:** My notebook doesn't have a docking station, so I'm constantly trying to connect the power cable, Ethernet cable, display adapter cable and a USB hub cable to the PC every morning when I come into work. Without the CableStrip, those cables would likely fall behind the desk or on the floor, causing more hassles every time I tried to reconnect them to the notebook. The holes on the CableStrip are large enough for the various sizes of cables, but small enough so that they don't fall through the hole to the ground. The tape is sturdy. Previous clamps I used lost their stickiness after a few weeks, but the CableStrip I tested has been on the desk for a good three months, and shows no signs of losing its grip. It's a solid value that solves a problem for notebook owners.

▶ **Grade** ★★★★★

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NETWORKWORLD

GAM

IFICATION OF THE ENTERPRISE

How to successfully add game features to corporate processes

BY MARIA KOROLOV

ILLUSTRATION: JUDE BUFFMAN

Can badges and scoreboards really make employees work harder, for no extra pay? Or will IT departments be stuck spending time and money "gamifying" work processes — only to have to undo everything once the fad has run its course? According to Gartner analyst Elise Olding, 25% of all redesigned processes will include some form of gamification by 2015.

And the size of the gamification market — estimated at around $100 million last fall — will grow to more than $2.8 billion by 2016, according to M2 Research. The company also predicts that the enterprise segment will account for a quarter of that total, the single largest market segment. But companies need to make sure they avoid the pitfalls of corporate gamification.

Badges? We don't need no stinkin' badges!

Seattle-based Slalom Consulting had 2,000 employees in offices around the United States. To improve internal communications, the company decided to create a mobile application that would help employees learn the names and faces of their colleagues. To encourage participation, the application included a "leaderboard" showing who had the highest scores, says CEO Brad Jackson.

The tactic backfired. "We found that only 5% of the people truly cared about being at the top of the leaderboard," he says. The prizes — gift cards — weren't enough, either.

"What changed for us is when we transformed to teams," he says. "Whether by organization, or randomly assigned teams, there was a dramatic shift in the engagement of the game. People didn't want to let their team down."

Participation grew from 5% to 90%, he says, and recognition scores went up from around 45% accuracy to 89%.

"In an environment where collaboration is so key, we saw some great wins come out of it," Jackson says. "I saw people getting on more projects they were excited about. Our new employees were called by name. And it's so wonderful when you are recognized when you walk into a company event — it increases career satisfaction."

Depending on the gamification project, badges, leaderboards and other rewards might not be needed at all.

Insurance giant Allstate solicits innovative ideas from employees with the help of a gamified social innovation tool from Pleasanton, Calif.-based Spigit two to three times a month.

"We don't necessarily use the reward system in the tool," says Matt Manzella, Allstate's director of technology innovation. "We have in the past, but people just want to participate." The key, he says, is to pick challenges that resonate with employees.

"We do turn away concepts," he says. "If we feel that a challenge statement is not compelling enough for the crowd to get excited about, we'll turn it down or ask them to come up with better challenges."

TOP 4 GAMIFICATION APPS

1. Crowdsourcing

Appirio is a Silicon Valley cloud vendor trying to compete against much larger consulting firms. Two years ago the company launched CloudSpokes, an online community that now counts as members 45,000 developers who compete to solve programming challenges.

The company involved developers themselves in making sure that there were no loopholes in the contests and in judging the results, says Narinder Singh, the company's chief strategy officer.

"Now all of a sudden the community is owners," he says. The result is an environment that lets people learn, and work, in a different way.

2. Call centers

Leaderboards are just the start of what companies can do to gamify call centers to improve morale and results.

"For call centers and IT support desks, gamification can provide real-time dashboards in a fun and engaging manner," says Siddhesh Bhobe, associate vice president at Persistent Systems, a global software product development company. The result, he says, is better productivity.

3. Social media and knowledge sharing

Corporate social media networks aren't usually as much fun as consumer-oriented social networks. And employees might need some incentives to share information and expertise that they previously hoarded.

For example, Bluewolf, a management consulting firm based in New York City, uses Salesforce.com's Chatter platform as its internal social network. At the beginning the year, the platform was gamified, with employees getting points when they post comments — and more points if that comment sparks a conversation. They also get points for sharing reports to their outside social networks, or publishing a blog post, or making presentations on weekly knowledge management calls.

Points, says Natasha Oxenburgh, Bluewolf's social programs manager, can be redeemed for flight upgrades, lunch with the CEO and trips to the Salesforce.com annual conference.

"The difficult part is trying to adjust the points," she says, "and trying to provide rewards that are of interest to all our employes, from the youngest to the more mature."

And the program needs to be adjusted frequently, with new challenges for participants, to keep it interesting. As a result, however, participation in the company's social network increased 57% during the first quarter of the year, she says, and the growth continued to scale up in Q2.

WE'VE BASICALLY GIVEN A MEGAPHONE TO ALL OUR EMPLOYEES. THIS IS REALLY HELPING US BUILD OUR BRAND."

Natasha Oxenburgh

SOCIAL PROGRAMS MANAGER // BLUEWOLF

4. Training

Learning games and simulations are great for teaching complex skills and conveying large amounts of content — and today's companies are going far beyond simple quiz-style games.

"We're building a massive territorial 3D immersive sales game," says Andrew Hughes, president of Franklin, Ohio-based Designing Digitally, which works with government agencies, universities and corporations, including the U.S. Air Force and TD Ameritrade. "It's like a multi-user Grand Theft Auto, but with salesmen."

Some companies think it's enough to take existing learning material and put it into a "Jeopardy!"-style quiz game, he says. "We don't see that as gamification. We won't even go down that route."

Instead, he recommends that companies look to today's best-selling games for inspiration.

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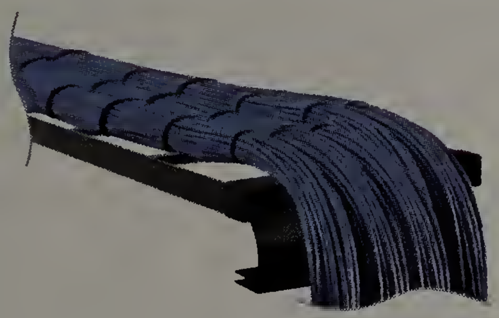

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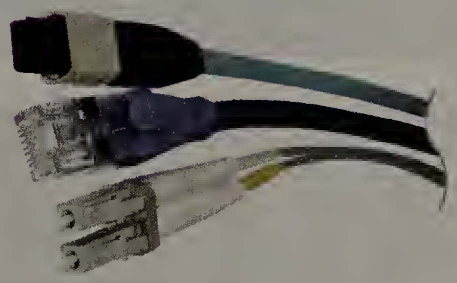

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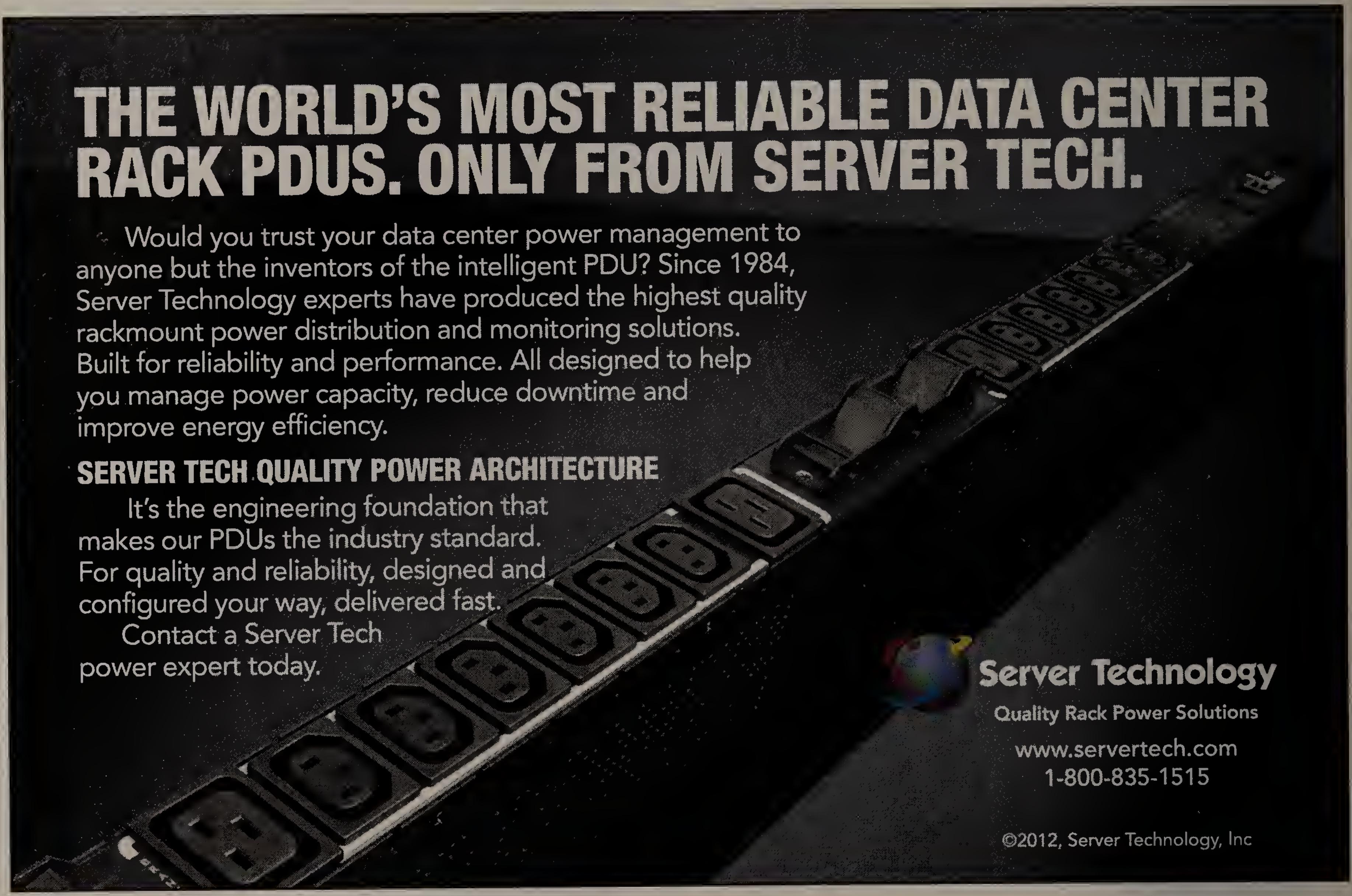

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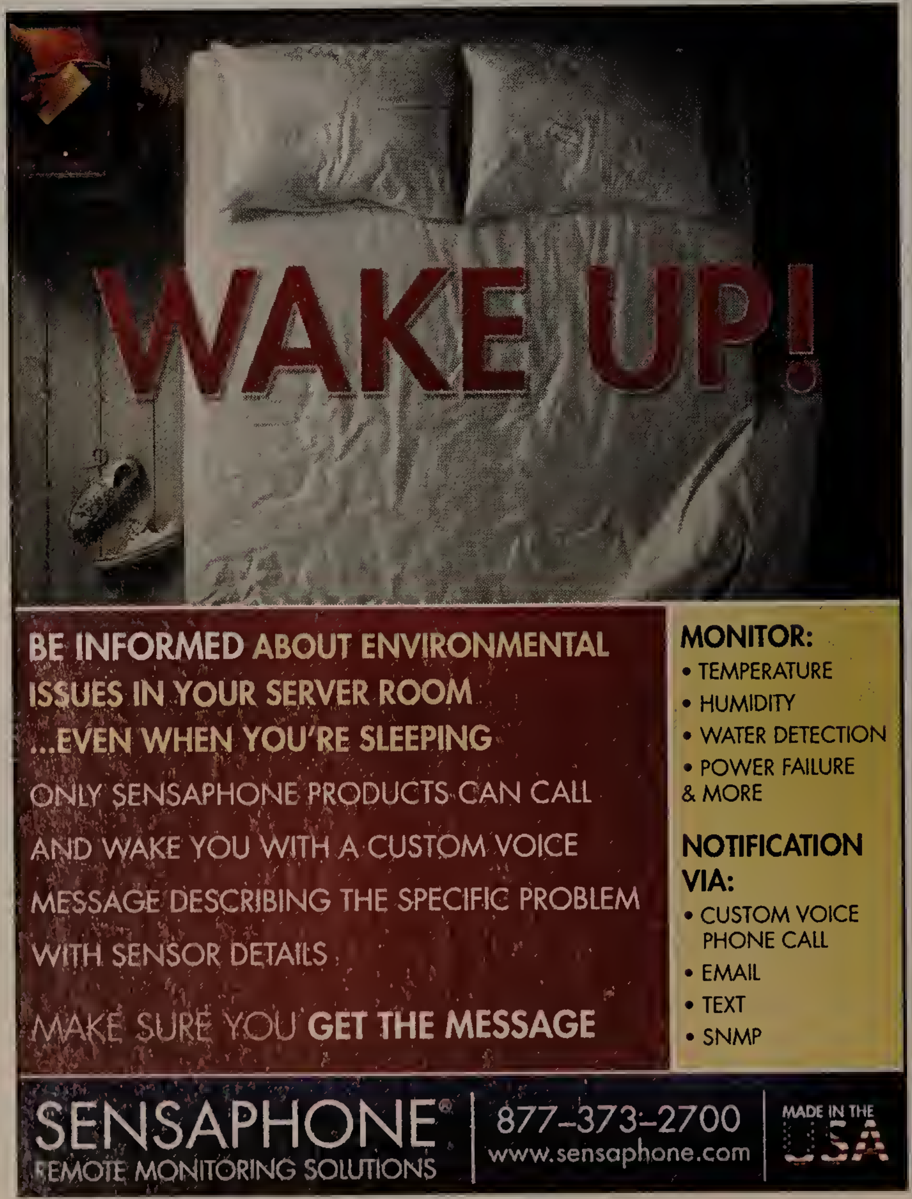

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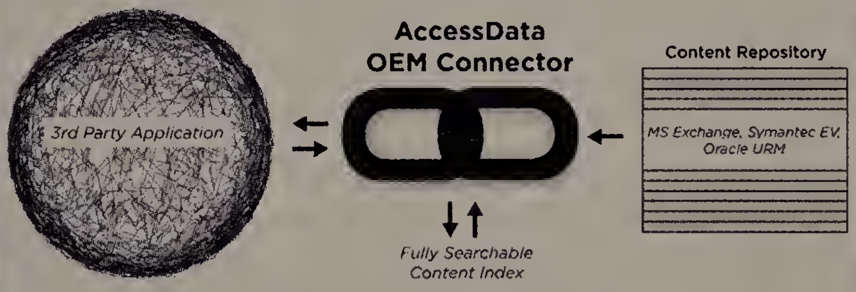
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One successful blitz resulted in changing the process of how claims are scheduled in an office.

"It sounds like a mundane process, but leadership didn't recognize how complex it was and how much stress it was causing employees," he says. Changing the process saved the company $18 million a year in adjusters' time.

Another successful blitz involved suggestions for features that should go into the company's mobile app. "It just comes down to the problem," he says. "People want to contribute to something that's outside their normal scope of work, but they don't want to contribute to improve some boring process. Mobile apps are low-hanging fruit — they participate like crazy."

It's also important to have buy-in from senior management, and a commitment to doing something with the results, he says.

Allstate has been running blitzes for four years, and has generated more than 5,000 ideas and more than a million visits to the tool. In addition to coming up with the ideas, participating employees can vote other ideas up or down, or add their own comments.

Their only reward is the personal satisfaction of solving an interesting problem. However, Manzella is considering adding some recognition features as well. "I would like to use more of the reputation management and point system [in Spigit]," he says.

The bottom line? Rewards need to be aligned correctly with the gamification project, as well as the company's culture.

Points of failure

Choosing the wrong rewards for a gamification project is one way to lead a project to failure.

Another is letting a project get stale. Video game companies know that they need to release updates, expansion packs and brand-new games to keep their players interested. Enterprise gamification programs also need to change and evolve.

"If you don't keep systems like this vibrant and current, if you don't continuously evolve your gamification approach, it will become boring," says Gabe Zichermann, chair of the Gamification Summit and CEO of Gamification.co. "Nothing is interesting forever."

Companies should also be careful not to try to use virtual rewards in place of reasonable compensation, he adds. While companies can save money by awarding badges and reputation points instead of cash bonuses, employees will see right through it if a company tries to use gamification as a substitute for being paid appropriate amounts and having good working environments, healthcare and management relations.

For some companies, it's the word "gamification" that causes problems. "Traditional managers are used to the idea that work is not supposed to be enjoyable," says James Gardner, chief strategy officer at Spigit. "I used to be the CTO of one of the largest government departments in Britain. I used to have middle managers say, 'My people are not here to play games at work, they're here to do their jobs.'"

Gardner suggests using the phrase "psychological dynamics" when approaching managers. "The word 'gamification' is guaranteed to cause enormous headaches."

Another trap to watch out for is that of unintended consequences. "When people first put sales contests into place, there were some people who quit as a result," says Arun Sundararajan, a professor at the NYU Stern School of Business who specializes in digital economics. "It causes salespeople to undercut each other, steal each other's business. But we've had these contests for 50 years, and have refined them over time, and understand what the unintended consequences might be."

With the new crop of gamification programs, that level of experience isn't there. As a result, he says, companies should start out slowly and carefully.

"It's a good idea for companies to start by using them in non-mission-critical scenarios, and get a sense of how employees are reacting to the new kind of competition, instead of just pulling it off the shelf and sticking it in," he says.

Finally, any gamification project needs to provide value to participants, and not just meaningless badges.

"People use Foursquare, it's very exciting," says Rajat Paharia, founder and chief product officer of gamification vendor Bunchball. "They play with it for a couple of weeks, and a month, and then they're like, 'Why am I doing this?' There needs to be something else there that's meaningful. There needs to be some core intrinsic value to the service. Empty points and meaningless badges are not sustainable."

That value can take different forms at different companies. It could come in the form of helping employees do their jobs better, or in seeing their ideas making a difference.

And value can take other manifestations as well, says Paharia. "You can get an iPad or golf clubs. You can get early access to content. And people want power, moderation ability, ability to join secret or exclusive groups."

Will it last?

It's too early to tell whether the gamification trend has long-term potential, says Sundararajan. "But there are a couple of reasons why I think it's promising."

The first is that employees are increasingly expecting to have technology at work that resembles what they use at home.

"They want the stuff that they see at work to be like Facebook, like Foursquare, like the iPhone," he says. "This is very different from 10 or 15 years ago, when there wasn't much technology developed just for the consumer."

And the trend is only accelerating, he adds. "In five years, every new employee would have grown up with Facebook and mobile devices," he says. "This is certainly something that is working in favor of gamification of the enterprise as a promising [long-term] trend."

In addition, some of the individual techniques used as part of gamification strategies have been used by companies in more limited contexts for many years, Sundararajan says.

"Everyone who's ever walked into a call center or sales center has used a leaderboard," says Gamification.co's Zichermann.

Another example is employee-of-the-month programs, which are common in many companies.

"Businesses have known for a long time that recognition can be used in place of cash rewards," he says. "What's new is that we have new language to describe it, and new technology to make it easier to do."

However, he would like to see more research into how well these new technologies work, he adds.

"There aren't any long-term studies that support the kind of current, broad, context-based solutions because this discussion didn't start until 2010," says Zichermann.

But gamification is about more than just badges and scoreboards. Those are just the start of the process of applying game techniques to work in order to make it more fun and engaging.

"We've done surveys at companies and the passion levels are very low — and the larger the company the lower the levels of passion," says John Hagel, co-chair of Deloitte's Center for the Edge. "If you believe, like we do, that passion drives extreme performance improvement, that's a real problem."

To find examples of passionate engagement, Deloitte looked to World of Warcraft, a massively multi-player online role-playing game.

"You get into the game in early stages and you're given very modest kinds of challenges that you can do yourself without any help," Hagel says. "And it draws you in further and the challenges get harder and harder and you're given an environment where you can connect to others and create teams to address those challenges."

However, he warns companies against trying to create a complex World of Warcraft-style game right from the start.

"In my experience, relatively few of those are successful," he says. Instead, he suggests that companies start with small projects, see how employees actually use them, and build from there.

Video games, after all, have been evolving for decades. Corporate gamification systems can take time to build, as well. ■

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RADIUS SERVERS

Low-cost RADIUS for Wi-Fi networks

Elektron, ClearBox, Microsoft NPS and FreeRADIUS enable Wi-Fi security for SMBs

BY ERIC GEIER

CLEAR CHOICE TEST

Remote Authentication Dial-In User Service (RADIUS) servers are common in enterprise networks to offer centralized authentication, authorization and accounting (AAA) for access control. But RADIUS servers can also be useful in small and midsize networks to enable 802.1X authentication and WPA2 (802.11i) security for Wi-Fi nets.

We tested four RADIUS servers that smaller businesses might consider: Elektron, ClearBox, Microsoft's Network Policy Server from Windows Server 2008 R2 and FreeRADIUS.

We measured ease of installation and configuration, quality of the documentation and the ability to customize configurations. All of the vendors scored well, with ClearBox on top and Elektron a close second, and FreeRADIUS and Windows Server NPS tying for third.

Elektron ($750) is a good entry-level and user-friendly server. ClearBox ($599) is a great choice for small networks, but it also scales to larger networks. Microsoft Windows Server 2008 R2 NPS is likely a given for organizations already running a Windows Server. But it lacks advanced features and database support. And FreeRADIUS (open source) is a solid and economical choice for Unix/Linux admins offering the most customization and flexibility.

Here are the individual reviews:

Elektron

The Elektron RADIUS server from Periodik Labs is a Windows GUI-based server that's targeted toward wireless authentication for small and midsize networks, but supports other AAA purposes as well. It's offered as a 30-day free trial and then costs $750 for a single server license.

Elektron can run on Windows XP Pro, Vista, Windows 7 and Windows Server 2003 and 2008. There's also a Mac OS X edition that runs on 10.5 or later or with an Intel Core Duo or better processor. Both require at least 512MB of memory and 20MB of free disk space.

Elektron supports multiple authentication methods. It also supports the following databases for the user account data: internal database, Windows accounts, Mac OS X Directory Services, Active Directory and other LDAP directories, SQL and other ODBC compliant data sources, Remote RADIUS servers and script.

We tested Elektron Version 2.2 in Windows Server 2008 R2 on a VMware virtual machine. The installation was very simple and only took about a minute. It uses a typical Windows installer and didn't prompt us for any server-related settings.

Immediately after the installation we found a Setup Wizard to help configure Elektron for wireless authentication. It prompted us to create a password (shared secret) for a wireless access point (RADIUS client) and helped configure/create a server certificate. The wizard was helpful, but could be improved by allowing you to enter passwords for individual access points rather than creating a catch-all entry for any access point, which is a less secure method.

After using the Setup Wizard we were left in the dark as to our next step. Since we're experienced with the RADIUS process, we knew we had to configure the Authentication Provider (we used the internal database) and input user account info (we created a user on the Elektron Accounts page). But those not familiar with RADIUS might be confused because the wizard doesn't cover this and the Getting Started section in the documentation skips it as well. Nevertheless, after configuring our wireless access point with WPA2-Enterprise we were able to authenticate via Protected Extensible Authentication Protocol (PEAP).

While reviewing the Authentication settings we found we could add multiple Authentication Providers and dynamically assign users to them based upon their Domain or Access Point Group, with support for stripping the domain from the incoming username. We also found supports for MAC address authentication, which, while not the most secure method, can be used to authenticate devices that don't support 802.1X security or other protocols supported by Elektron. Another notable feature is the ability to block logins after multiple failed password attempts.

Authentication settings in Elektron

In the Authorization settings, we could create

NETRESULTS

Product	Elektron RADIUS	ClearBox RADIUS	Windows Server 2008 R2 Network Policy Server	FreeRADIUS (open source)
Company	Periodik Labs	XPerience Technologies	Microsoft	Commercial support available from Network RADIUS
Price	$750 for a single server license	$599 for a single server license	Unlimited number of clients free with Windows Server 2008 R2 Enterprise Edition	Free
Pros	Easy installation, user-friendly	Scalable, feature-rich, easy to use	Free with Windows Server, includes Network Access Control (NAC)	Excellent features and functionality
Cons	Setup wizard could be improved	Windows only, documentation could be improved	Lacks customization and advanced functionality	Unix-only, non-GUI server that requires an experienced Unix/Linux admin
Total score	4	4.25	3.75	3.75

SCORECARD

Product	ClearBox	Elektron	FreeRADIUS	Windows Server NPS
Installation (25%)	5	5	4	4
Ease of use (25%)	4	4	2	4
Customization (25%)	4	3	5	2
Documentation (25%)	4	4	3	4
Total	**4.25**	**4**	**3.75**	**3.75**

Scoring key: 5: Exceptional; 4: Very Good; 3: Average; 2: Below Average; 1: Consistently subpar

custom polices. We could deny connections, assign users to virtual LANs, append custom RADIUS response attributes or execute a script based upon various triggers: login time, username, user group, access point group, media access control address group or the result of a script. These provide the authorization functionality SMB networks usually require, but don't provide the full customization ability larger or service provider networks might require.

In the Accounting section we found basic access and error logs, viewable only in the GUI and not able to be sent to a database. We were impressed with the Event Handler feature that allows you to easily enable notifications on events like logins, failed logins, password lockouts and errors.

In the main server settings Elektron supports remote administration so you can manage the server from other PCs, and server replication to set up a backup server.

Overall, Elektron is a solid, attractive and user-friendly server. Though the Getting Started section in the documentation could be improved, generally it was informative and useful, and should be understandable by those less experienced with RADIUS. Elektron is a great option for small and midsize networks.

ClearBox Enterprise RADIUS Server

ClearBox Enterprise RADIUS Server from XPerience Technologies is a Windows-based RADIUS server that can serve the AAA needs of small businesses or even large networks with millions of users, according to the company. Like the Elektron RADIUS server, ClearBox is a GUI-based program. The company offers a 30-day free trial and then charges $599 for a single server license.

ClearBox can run on any Windows platform from Windows 2000 up to Windows 7 and Windows Server 2008 R2. It requires only a Pentium II or higher processor, 256MB or more of memory, and at least 16.6MB of free disk space for the full install.

ClearBox supports multiple authentication methods. ClearBox allows the use of concurrent data sources and supports: internal database, Windows accounts, Active Directory and other LDAP directories, SQL and other ODBC and OLE DB compliant data sources and Remote RADIUS servers.

We tested using ClearBox Version 5.7, released in March, in Windows Server 2008 R2 on a VMware virtual machine. The installation was simple and took less than two minutes. It uses a typical Windows installer and only prompts you for three server-related settings: the mode (Normal or Debug), the Control Centre password and whether you want to enable wireless authentication.

After finishing the install, the ClearBox Manual is by default set to automatically appear. We found the documentation to be thorough, but quickly noticed some slight inconsistencies. For example, some button names mentioned differ from what is on the GUI and the instructions for testing the server after setup were incomplete. Nevertheless, we were able to quickly configure ClearBox for PEAP wireless authentication, including creating a server certificate via the Certificates Wizard.

We also tried out the Configuration Wizard that helps those less experienced in RADIUS understand and set the basic settings: adding RADIUS Clients and selecting a user database. We found this wizard informative and easy-to-use.

After configuring our wireless access point with WPA2-Enterprise and successfully authenticating via PEAP, we poked around the advanced ClearBox settings. We found it supported multiple realms, so incoming requests can be handled via a different set of authentication, authorization and accounting settings based upon the username, client IP, RADIUS attributes, Windows group membership or custom SQL result. Additionally, it supported username rewriting in case you require processing requests without a domain name.

Authorization settings can always be manually created in the Black, Check, Response and Reject-Response lists using any RADIUS attributes and values. But authorization settings are also configurable via the Users Manager, if you're using the ClearBox internal user database, which include settings to enforce login hours, set time credits, set per-user concurrent session limits and restrict logins to a specific client using its MAC address.

In the Accounting settings, we could log accounting details to the internal database, an external database or a file. Interestingly, it also included the ability to cache accounting data if the database is unavailable. Though not indicated in the GUI, ClearBox also supports third-party billing systems.

Other logging features include a Server Statistics page to view a rundown of packet types sent and received, an Online Logging page to view real-time activity and text-file logging of server errors and RADIUS packets.

In the main Server Settings, ClearBox supports remote administration, server replication in case you want to set up a backup server, advanced RADIUS settings and advanced logging settings. And another notable feature is the ability to enable monitoring and alerting that can automatically restart the server and send an email alert if ClearBox stops responding.

Overall ClearBox is feature-rich and easy-to-use. Its thorough documentation and the internal user database make it user-friendly for smaller organizations that might lack RADIUS experience. And its customization and wide database support allow use by larger organizations.

Microsoft Windows Server 2008 R2 NPS

Microsoft's Windows Server platform provides a RADIUS server, an economical option for those already running (or planning to run) a Windows Server. Starting with Windows Server 2008, Microsoft provides the RADIUS service with its Network Policy Server (NPS) role, whereas previously it was provided by the Internet Authentication Service (IAS) role. Like most other Windows

Server roles, NPS configuration is GUI-based.

NPS provides different functionality depending on the edition of Windows Server 2008 or 2008 R2. The Web Server edition is the only one that doesn't include the NPS role/feature. The Standard Edition supports a maximum of 50 RADIUS clients (access points) and a maximum of two remote RADIUS server groups. The Enterprise and Datacenter editions allow an unlimited number of RADIUS clients and remote RADIUS server groups.

NPS supports the basic common authentication protocols. Additionally, Microsoft allows plug-ins of other vendors' EAP methods.

For authentication NPS only allows the use of Active Directory for the user account database, in addition to being able to proxy requests to other RADIUS servers for processing. For RADIUS accounting you can write to a text file and/or store in a Microsoft SQL Server database.

We evaluated NPS in Windows Server 2008 R2 on a VMware virtual machine. Before enabling NPS we performed the initial configuration of Windows Server and set up an Active Directory domain. Then we used the documentation from Help and Support within Windows for information on how to configure NPS for 802.1X, which we found complete and thorough, targeted toward administrators. We spent about 10 minutes enabling the Certificate Services role and creating a certificate authority (CA). Next we enabled the NPS role and registered it with Active Directory, which was done in less than five minutes.

Then we selected the 802.1X configuration scenario and ran the configuration wizard that helped us add RADIUS clients (access points), select the authentication protocol (PEAP) and choose user groups to apply to the NPS server. The wizard also allowed us to configure traffic controls, which are RADIUS attributes (such as VLAN assignments) you can configure to be sent to the RADIUS clients and applied to authenticated and authorized users.

After configuring our wireless access point we could authenticate via PEAP authentication. Like the other servers, NPS supports multiple policy configurations. You can create policies with specific conditions of requests (user groups, NAS port type and many other conditions) and requests that match those are given a set of authentication and authorization settings. You can define settings like exact authentication protocols, day and time restrictions and custom reply RADIUS attributes (such as for VLAN assignments).

Unlike the other RADIUS servers we reviewed, NPS includes Microsoft's network access control (NAC) implementation called Network Access Protection (NAP). It's basically an enhanced form of authorization controls, where you can allow or deny access based upon health policies.

For RADIUS server logging and accounting, NPS supports writing to a text file and/or storing in a Microsoft SQL Server database. For each it gives you the ability to specify what you want to log. For SQL logging it gives you the ability to enable text file logging in case of SQL failure. For text file logging you can specify when it should automatically create new logs.

Overall the NPS role of Windows Server 2008 R2 provides adequate AAA services, but lacks some customization and advanced functionality found in other servers like FreeRADIUS and ClearBox. Nevertheless, it's still a great and economical option for small and midsize networks already running a Windows Server with Active Directory.

FreeRADIUS

FreeRADIUS is a free and open source RADIUS server released under the GNU General Public License Version 2 (GPLv2) with commercial support available from Network RADIUS. Designed to run on Unix and other Unix-like systems, like Linux, it's primarily a non-GUI server in which you adjust settings in configuration files and run the server via command line. Thus it's best for administrators with Unix/Linux experience. It can serve the AAA needs of small networks with a few users or even service providers with millions of users.

There isn't any published hardware requirement for FreeRADIUS, but generally any commodity PC can serve up to a few hundred thousand users. It can run on a variety of platforms in many different operating systems, including Linux (CentOS, Debian, Mandriva, Red Hat, SUSE, Ubuntu), Solaris and FreeBSD. Many OSs have FreeRADIUS binaries in their package repositories, making the installation simple, but they might not be updated with the latest release. In these cases you can build the packages yourself with the FreeRADIUS source code but this can be a challenge, especially for those less experienced with Unix/Linux.

FreeRADIUS supports the following databases and data sources: included flat files, Linux accounts (/etc/passwd files), Active Directory and other LDAP directories, SQL and other ODBC compliant data sources, Remote RADIUS servers, external shell, Python, Perl scripts, Redis, DBM files, Ruby and Java.

We tested FreeRADIUS in Ubuntu 12.04 LTS on a VMware virtual machine. We installed it via the Ubuntu package, which was FreeRADIUS v2.1.10 instead of the most current v2.2.12. The installation was very simple and only took a few minutes, but can be a very different matter if you must compile from the source code yourself.

Next we followed the documentation on the FreeRADIUS wiki to configure the server, which didn't completely match with our default Ubuntu installation but did put us in the right direction. We also noticed some of the documentation is outdated and could use some better organization.

After completing the basic configuration and testing, the wiki wasn't very clear on what to do next to get PEAP authentication working. But we did find help on another site, which is maintained by a FreeRADIUS developer and offers seemingly more up-to-date documentation.

FreeRADIUS includes the ability to dynamically assign configuration to connecting users via many different criteria, similar to the other servers we reviewed, but offers the most flexibility and customization. Additionally, a major feature that sets FreeRADIUS apart from the others is the virtual server support, similar to virtual servers in Web servers (Apache, Nginx).

You can connect multiple virtualized configurations to different IP/port sockets, while all running from one FreeRADIUS process, with the ability to proxy packets between them. This allows for different NAS types (ADSL, Wi-Fi, WiMax, VPN) to be handled by completely separate configurations.

FreeRADIUS includes most features and functionality that we discovered in the other servers, such as domain name stripping from the incoming username, MAC address authentication, concurrent session limiting and failed login lockout protection. And if FreeRADIUS doesn't include a feature or function by default you can most likely implement it via the configuration files, by adding modules, or even by making source code modifications.

Overall, FreeRADIUS is a feature-rich, highly customizable and flexible server. It's a great and economical choice for the AAA needs of any size network, but is best for use by administrators already experienced with Unix/Linux. ■

Geier is a freelance tech writer. He's also the founder of NoWiresSecurity, which provides a cloud-based RADIUS service for Wi-Fi security, and On Spot Techs, which provides on-site computer services.

NETWORKWORLD

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BACKSPIN | BY MARK GIBBS

Facebook, Twitter begin slide into irrelevance

THERE'S ONE huge problem with social media and it's much the same problem that we face with the major ISPs: The concentration of market power in the hands of a few gigantic service providers means the services are hugely oriented toward the interests of the providers and only marginally those of their customers.

When it comes to social media providers such as Twitter and Facebook all is not rosy, however, because they have a big problem: They have billions of users, but how to make money out of them?

The trouble is social media users are cheap and they won't pay to use Facebook or Twitter. This means there's really only one way for the companies to make money: advertising.

But with a business model based on advertising comes a problem: To get top dollar for ad placement the service providers need to effectively target their users to improve "clickthrough" rates. That requires the user's personal data to be mined and now we have a huge consequence: Mining user data essentially destroys any notion of privacy which, in turn, alienates users.

There's also another problem: Can social media providers generate enough revenue from advertising to survive? Consider Facebook. Since the company's seriously over-hyped IPO in May its stock price has tanked from $38 to $18.96 (it has been as low as $17.55).

What Facebook is currently looking for is a unicorn, an advertising model that will deliver what advertisers want but not annoy users so much that they abandon ship.

There are three possible outcomes to this search: The first is they find a unicorn and become another Google. The second is they find not a unicorn but a horse and make some but not a Google-load of money. The third is, of course, they just carry on as they have been doing. The latter two outcomes both have much the same result: a slow MySpace-like slide into irrelevance (the horse version could be much slower, depending on how happy or otherwise they make their users).

So, what probability would you assign to Facebook finding a unicorn? I'd put it at no more than maybe 1% at most. Finding a horse? Perhaps 10%. Finding an empty field without a horse or a unicorn? 89%. In other words, I don't think Facebook is a long-haul proposition and I'm guessing it has, at the least, a 99% chance of going the way of the dinosaurs.

Much the same long, slow slide into irrelevance probably also awaits Twitter. Twitter management has recently made a number of significant changes to its API that will make it harder, not easier, for third-party user applications to interact with the Twitterverse. It appears that Twitter is becoming more focused on business use, and far less interested in enterprise applications or consumer clients. I'd say those are a big mistakes.

Be that as it may, the future of social media will be smart tubes carrying social media traffic. Smart tubes that aren't advertising supported and provide a common communications mechanism that's not as constrained as, say, Twitter, or as intrusive as, say, Facebook. I know just what might be the smart tubes of the future. Tune in next week ... ■

Gibbs, in Ventura, Calif., is taking bets on Facebook's future. Your odds to backspin@gibbs.com and follow him on Twitter (@ quistuipater) and on Facebook (quistuipater).

NETBUZZ | BY PAUL MCNAMARA

Verizon offers 2 defenses of indefensible fee

WHY DOES Verizon charge $5 a month merely to keep my telephone number unpublished?

Verizon's media relations department essentially says it's for my own good — you know, as in I should thank them, I suppose. They also say the fee is "chiefly systems and IT based," a contention I'm anxious to see judged by the systems and IT experts in the crowd.

Meanwhile, Verizon's online customer service department offers a completely different answer to the same question — and, as you'll see later, this reply is comically unenlightening. In other words, exactly what you might expect from online customer service.

Of course, the real reason Verizon charges this $5 fee is because it can and people like me will pay.

Here's what I asked both Verizon departments: "Why do you charge me $4.95 per month just so that I can keep my phone number unpublished? Please do not merely tell me that you are allowed to charge me this fee because I already know that. What I want to know is WHY do you do it? What cost are you passing along? . . . I would appreciate as much specificity in your reply as possible."

Here's the reply from a media relations spokesman, who first consulted with "a key member of product management with oversight for (unpublished) numbers":

"The cost charged to offer unlisted phone numbers is chiefly systems and IT based. Specifically, the costs we incur and factor into the monthly charge involve three things: quality control, data integrity and the interface we have with other carriers and directory publishers. These activities help us protect the feed of customer information we have, and must protect, when customers request that their telephone number remains private when requested."

See what I mean? They're going the extra mile on my behalf to protect my privacy. And, after all, I asked to be treated this way.

As for the costs cited? Sixty bucks a year to not publish my number? Call me skeptical.

But even if some of us want to doubt the veracity of that answer, at least the media relations department took an outwardly honest stab at addressing the question. In contrast, here's an abridged version of the verbose yet empty response I got to the exact same query from "Roishawn" in Verizon's online customer service:

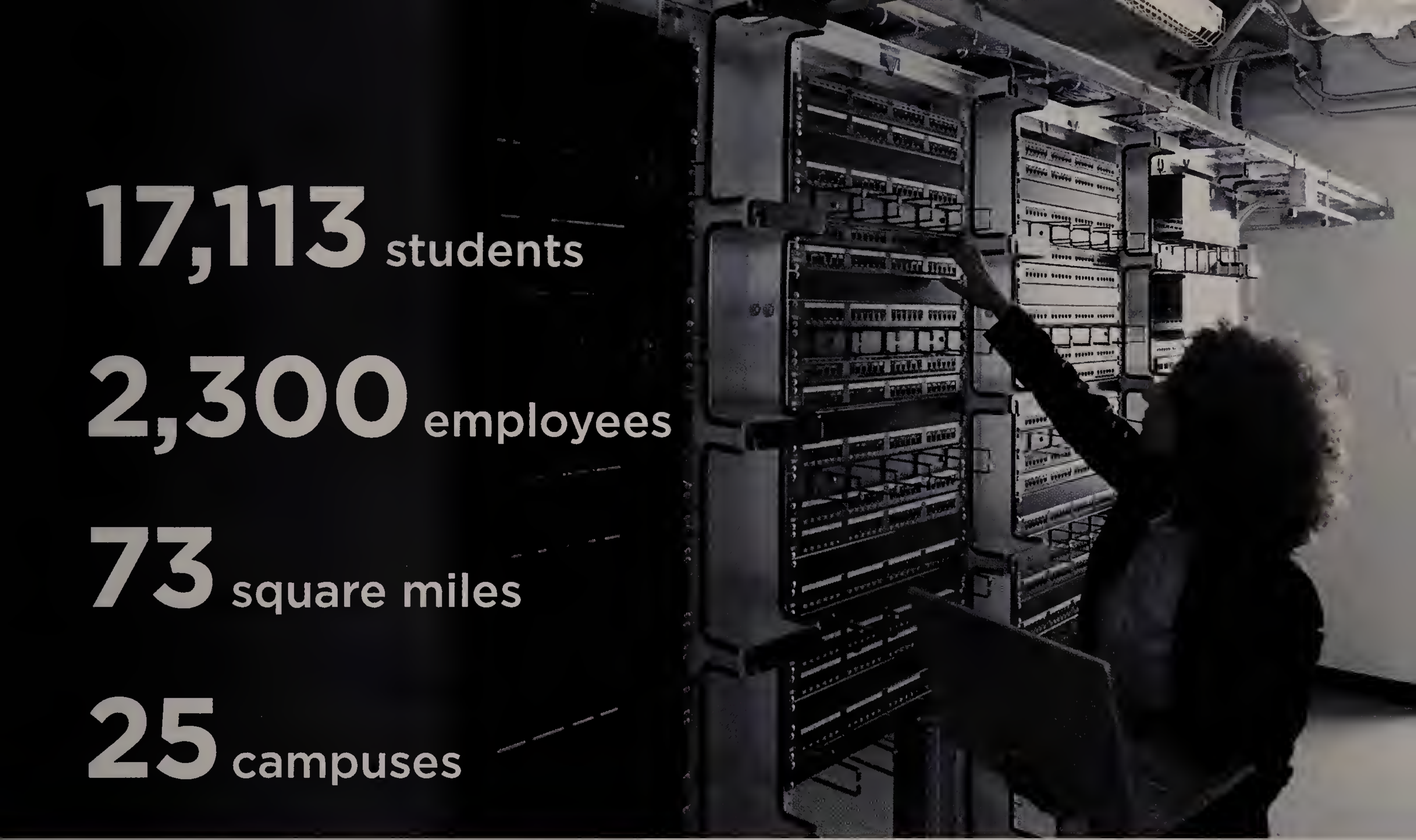
"A non-published number will not be printed in telephone directories and Directory Assistance operators will not provide the number to callers requesting it. If a caller requests a number from Directory Assistance and the number is non-published, the caller will receive the message, 'The number requested is non-published.'

"It is an FCC mandate to notify you that if you have chosen non-listed or non-published service, your billing name and address will be shared with your chosen long distance provider for billing purposes."

There's more, but you get the idea. And can't you see Roishawn sitting in his cubicle saying to himself: "The guy wants specificity. I'll give him specificity." And he clicks on every single canned reply that so much as mentions the word unpublished. I couldn't help but laugh.

But at least Roishawn didn't try to tell me that keeping an unpublished phone number unpublished costs Verizon $5 a month. ■

Feel free to chime in. The address is buzz@nww.com.



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